

FIG 1

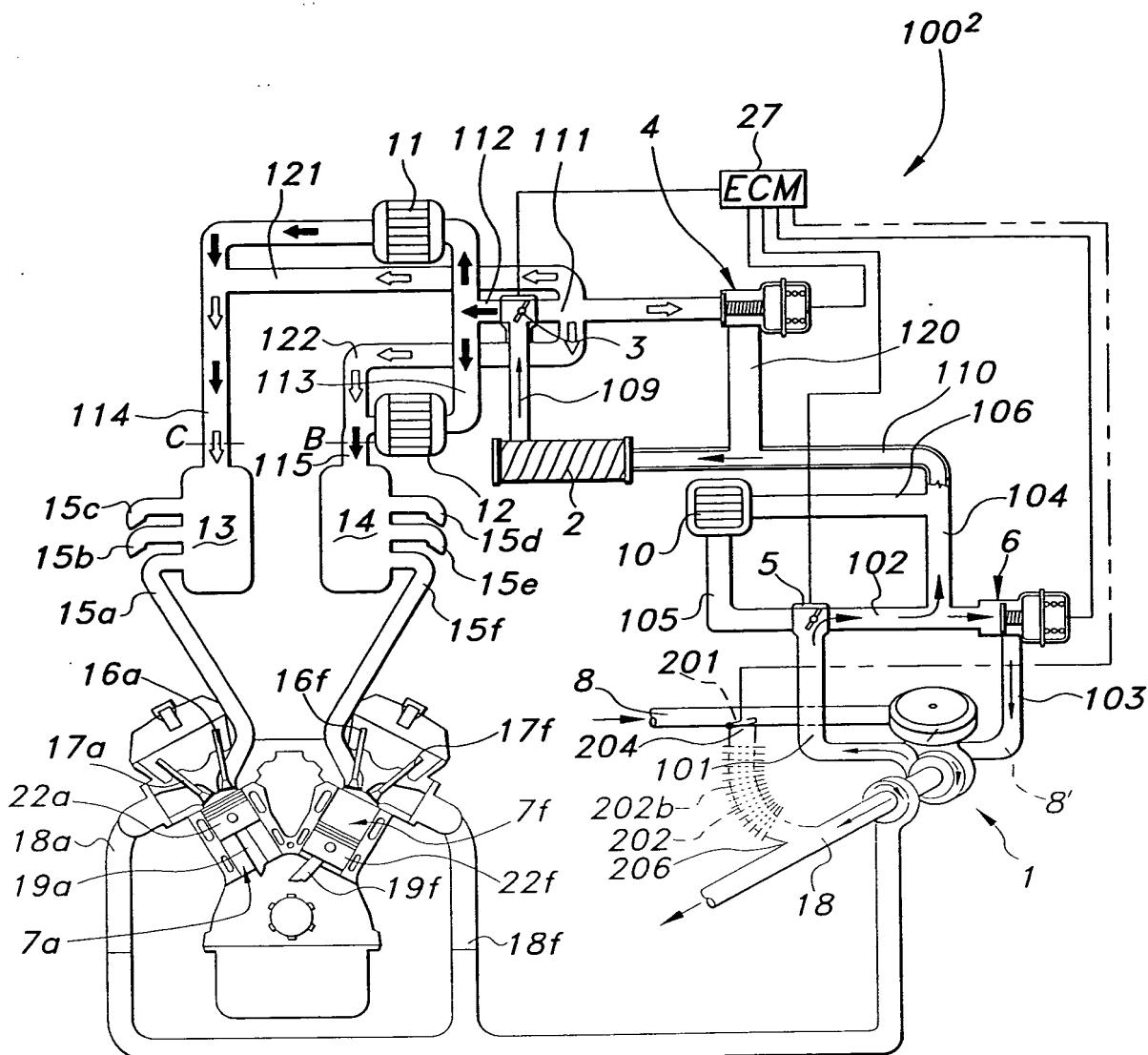


FIG 2

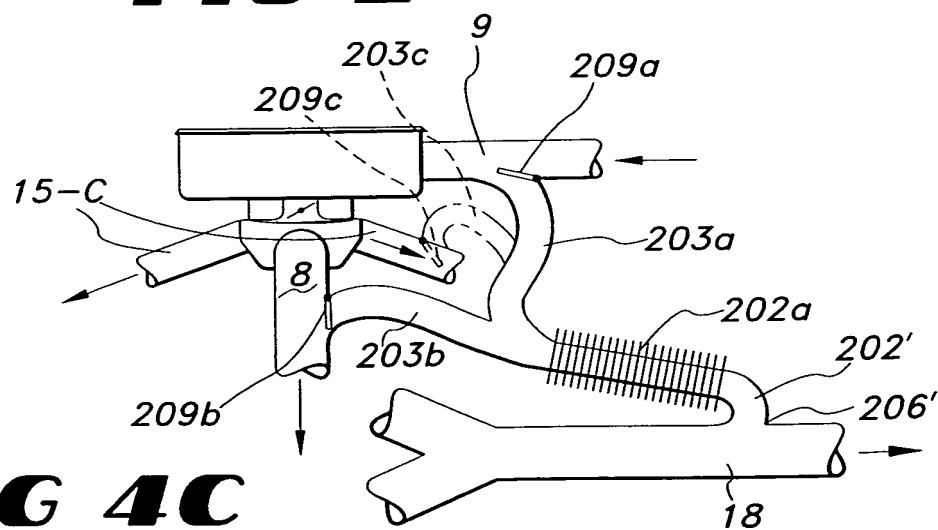


FIG 4C

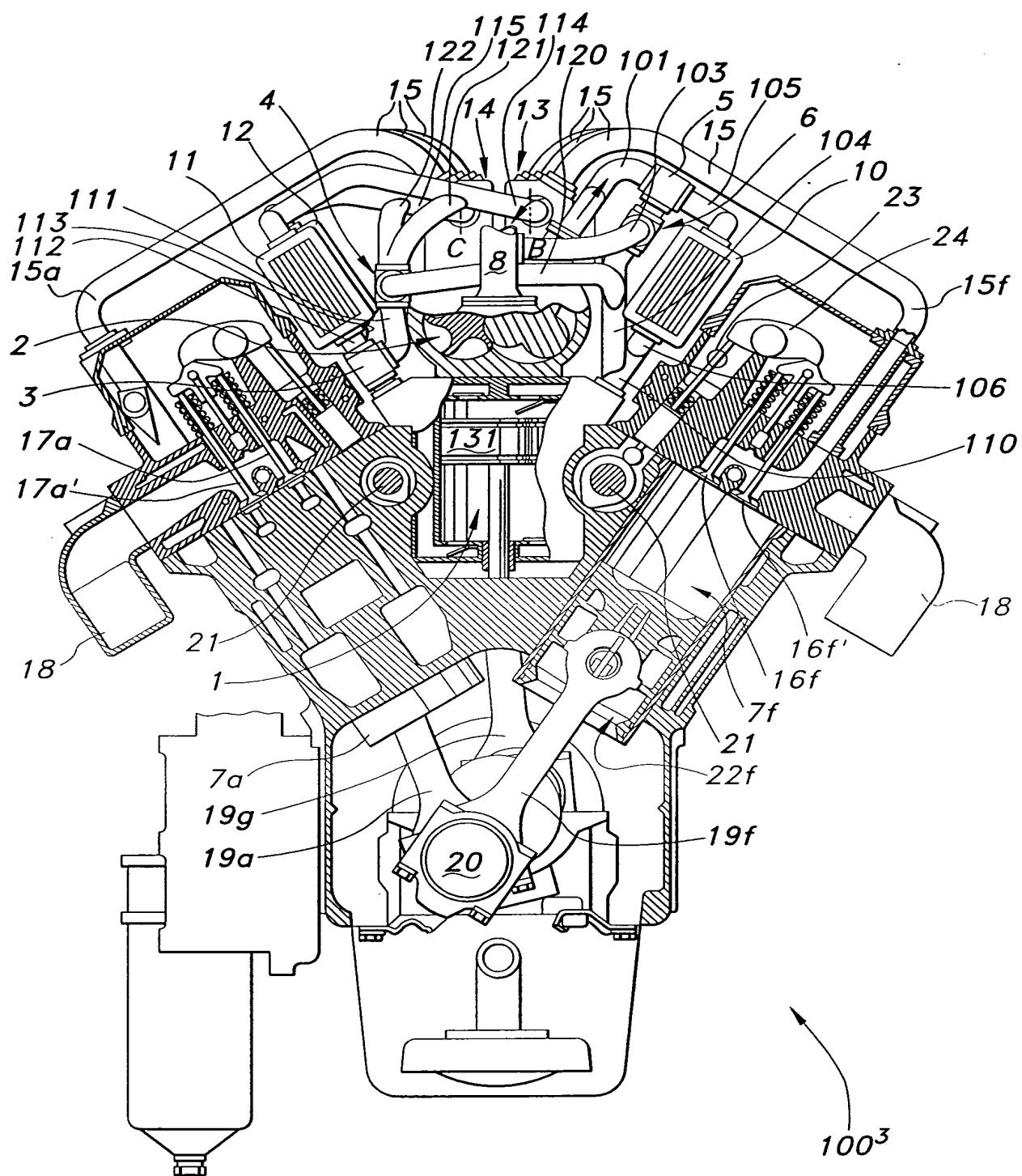


FIG 3

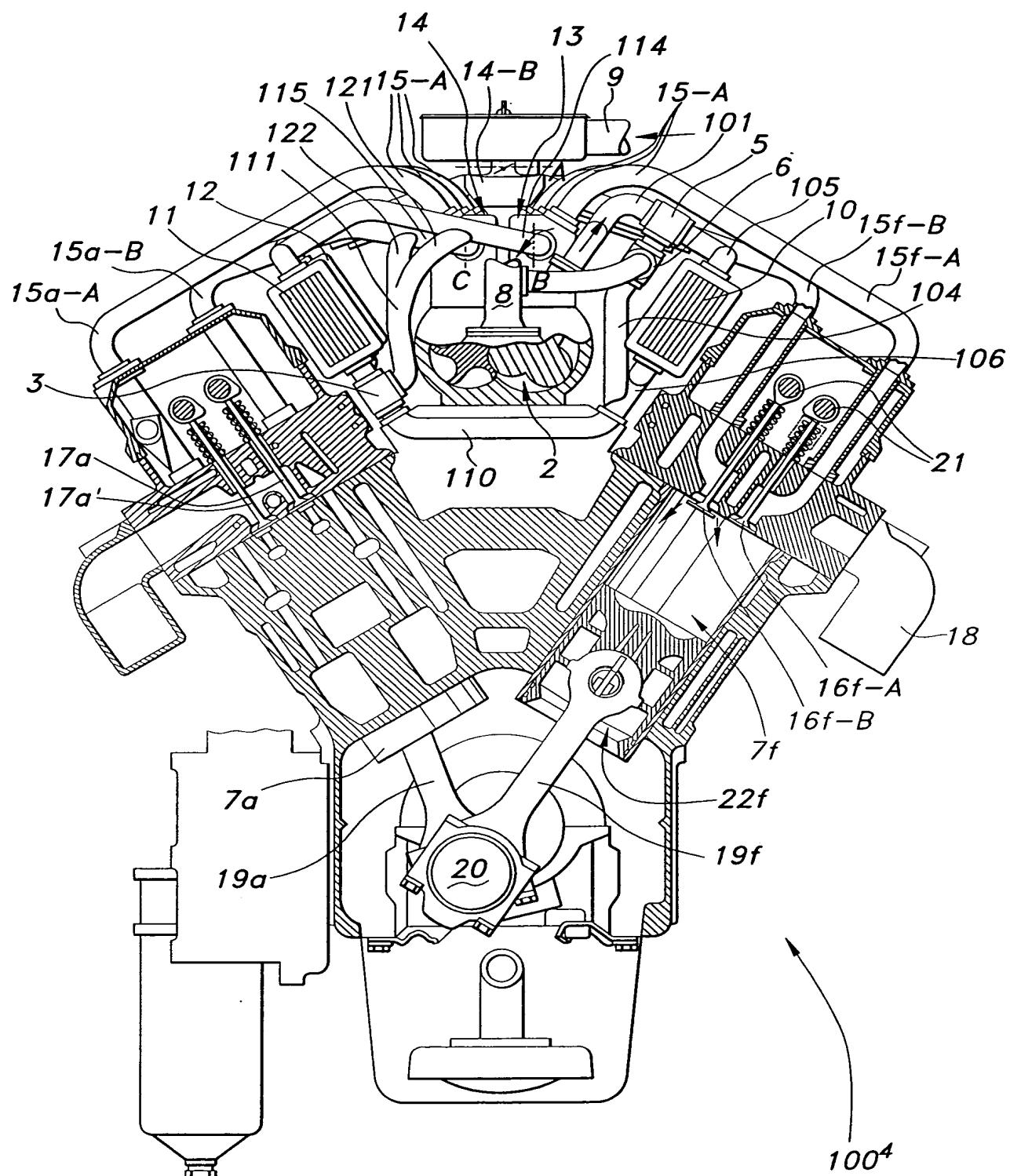


FIG 4

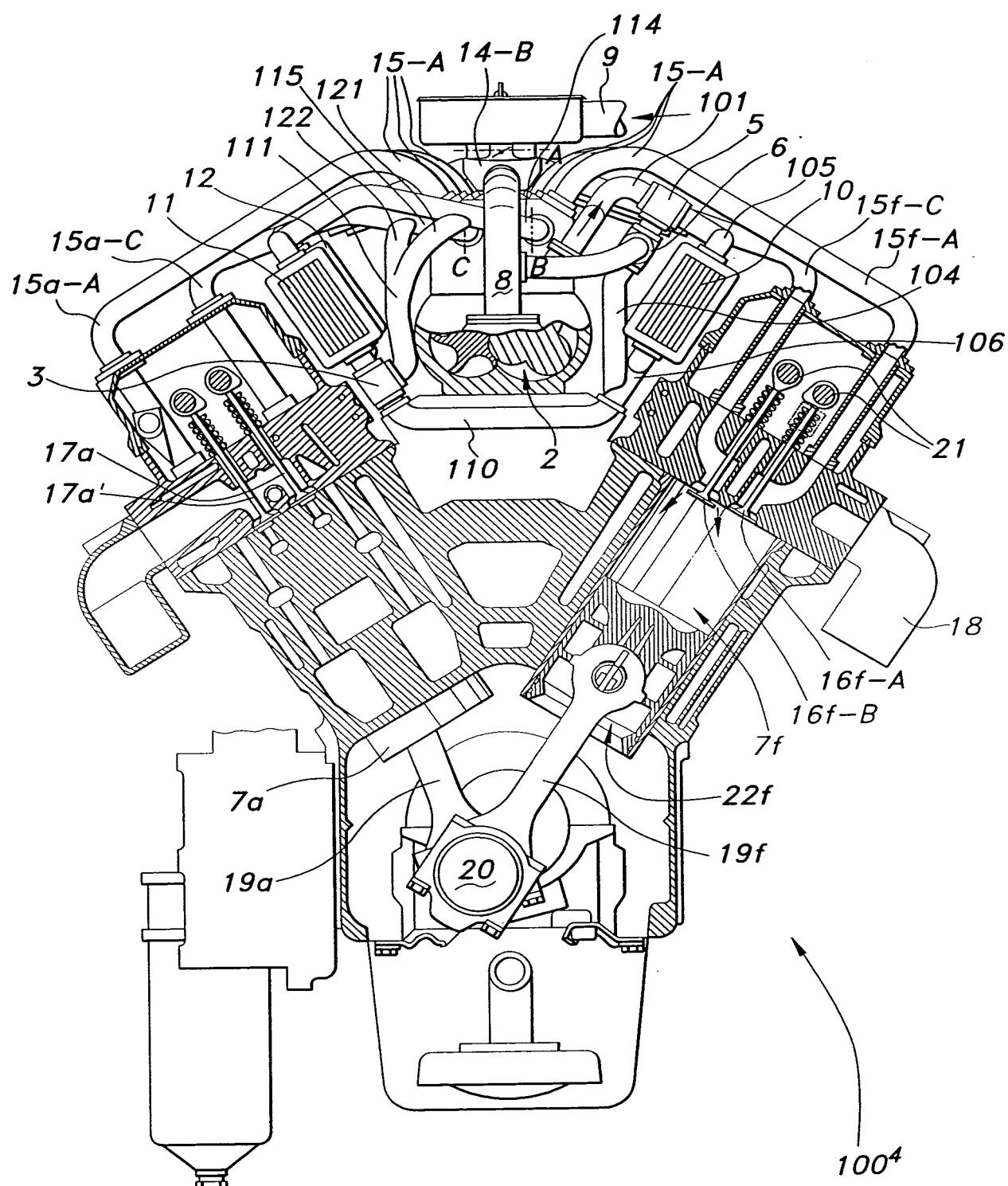
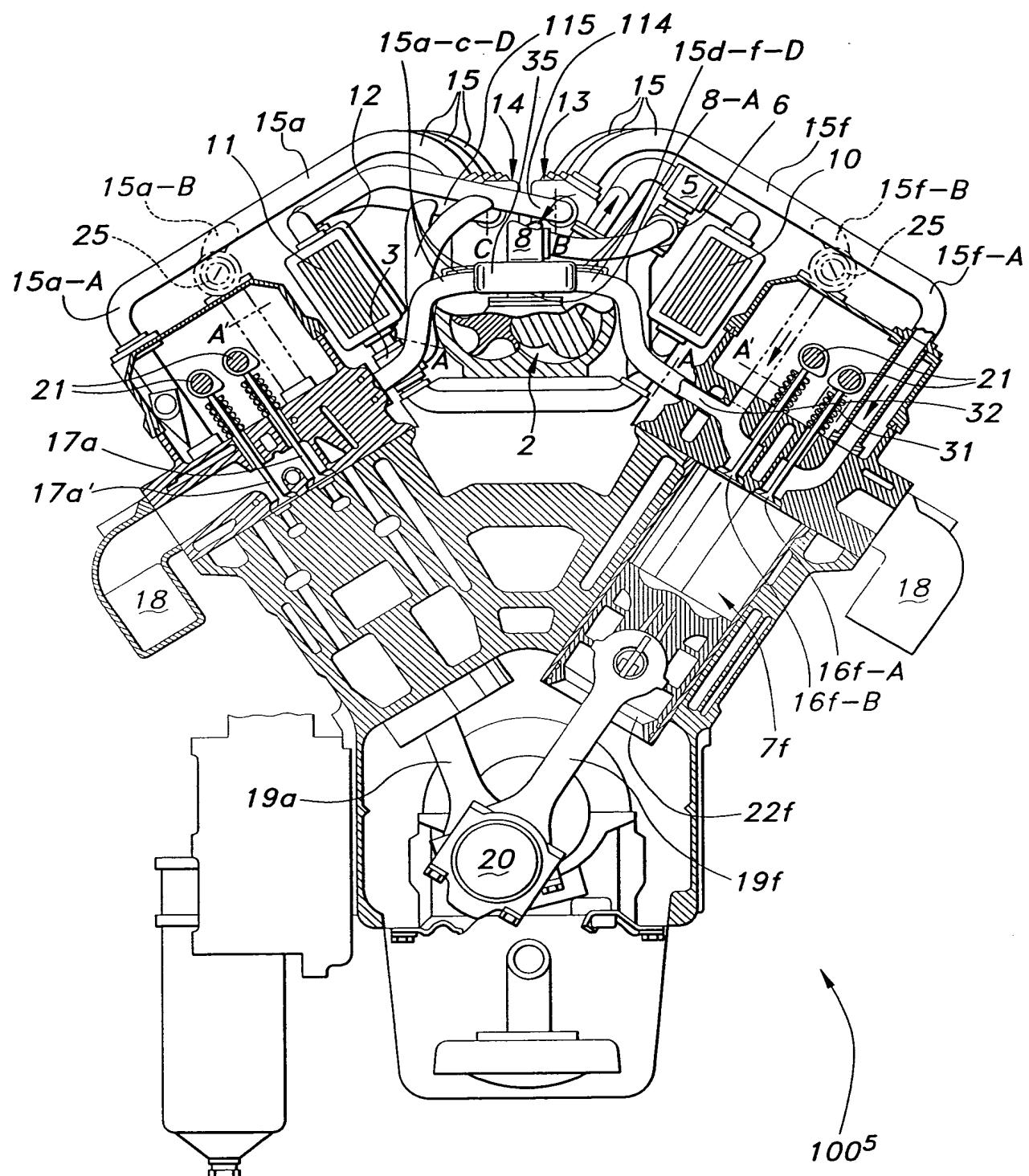


FIG 4B



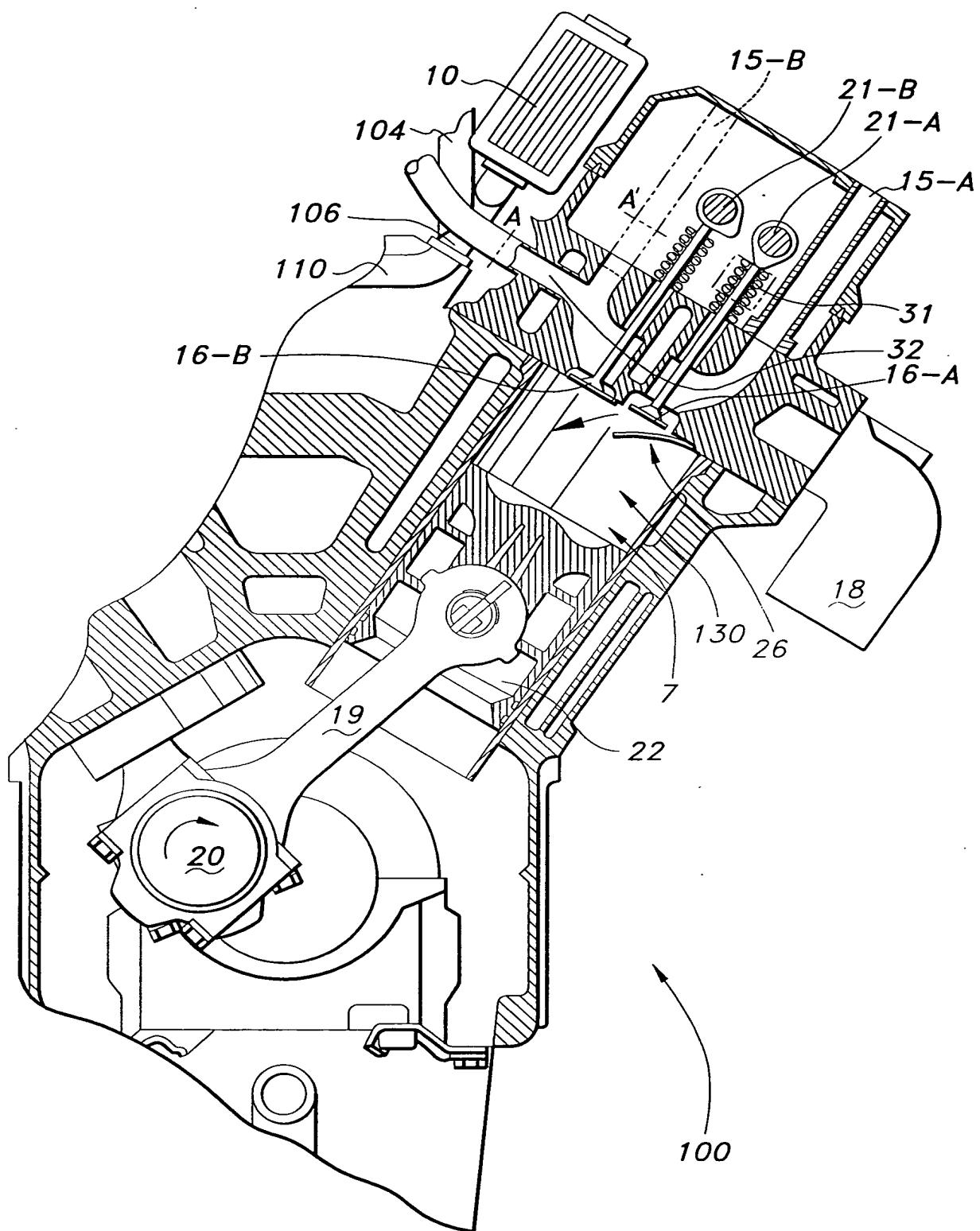


FIG 6

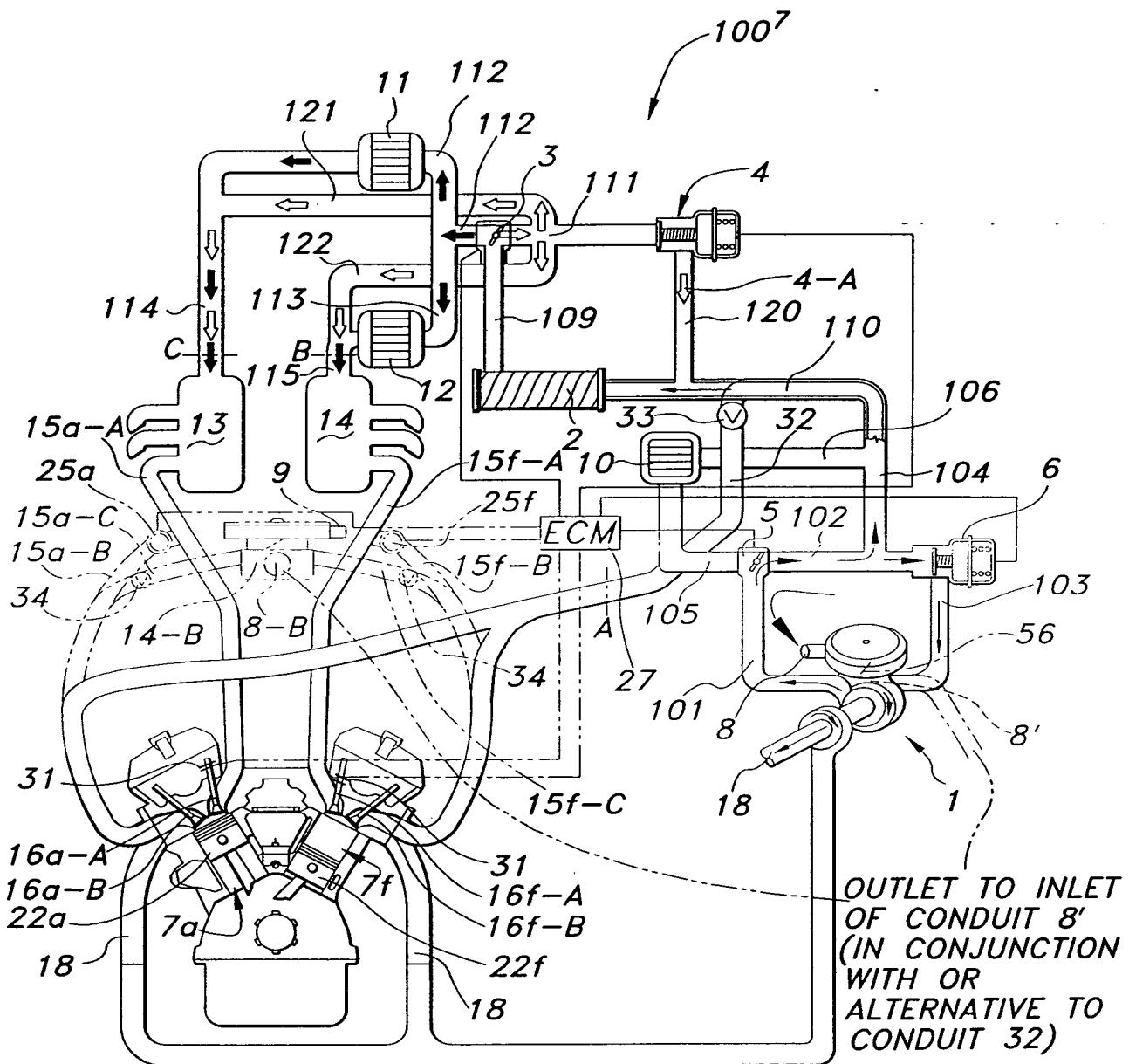


FIG 7

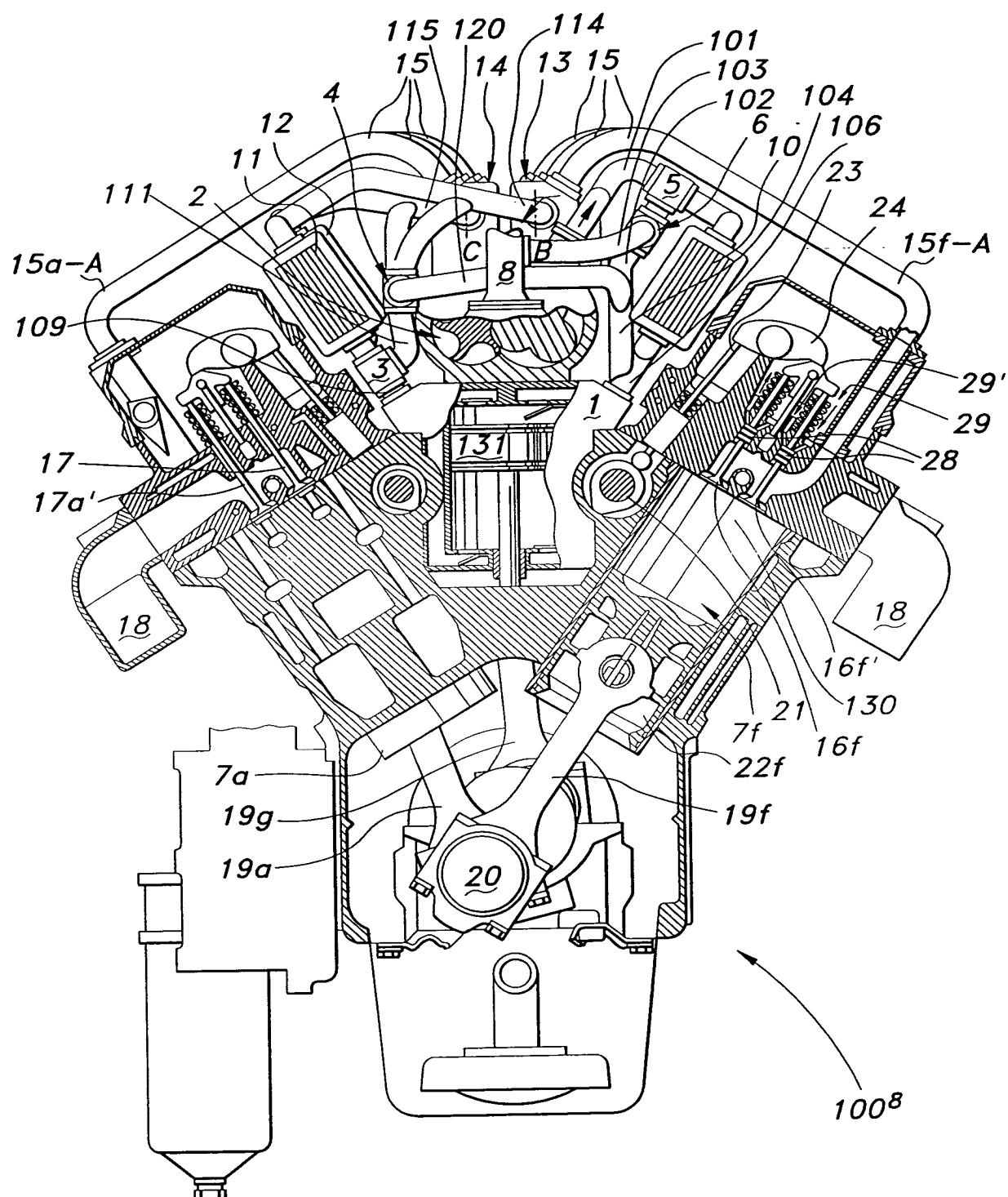


FIG 8

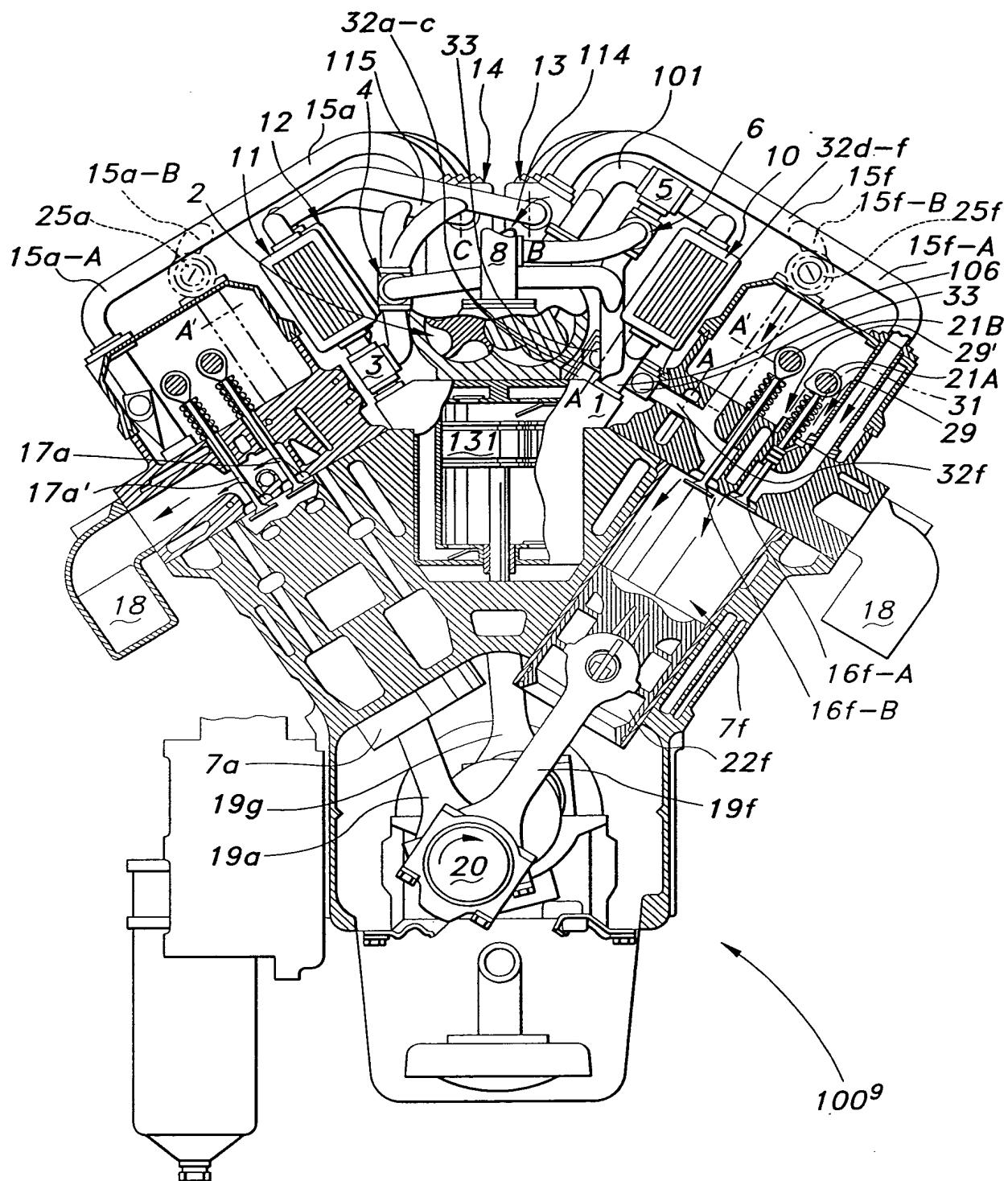
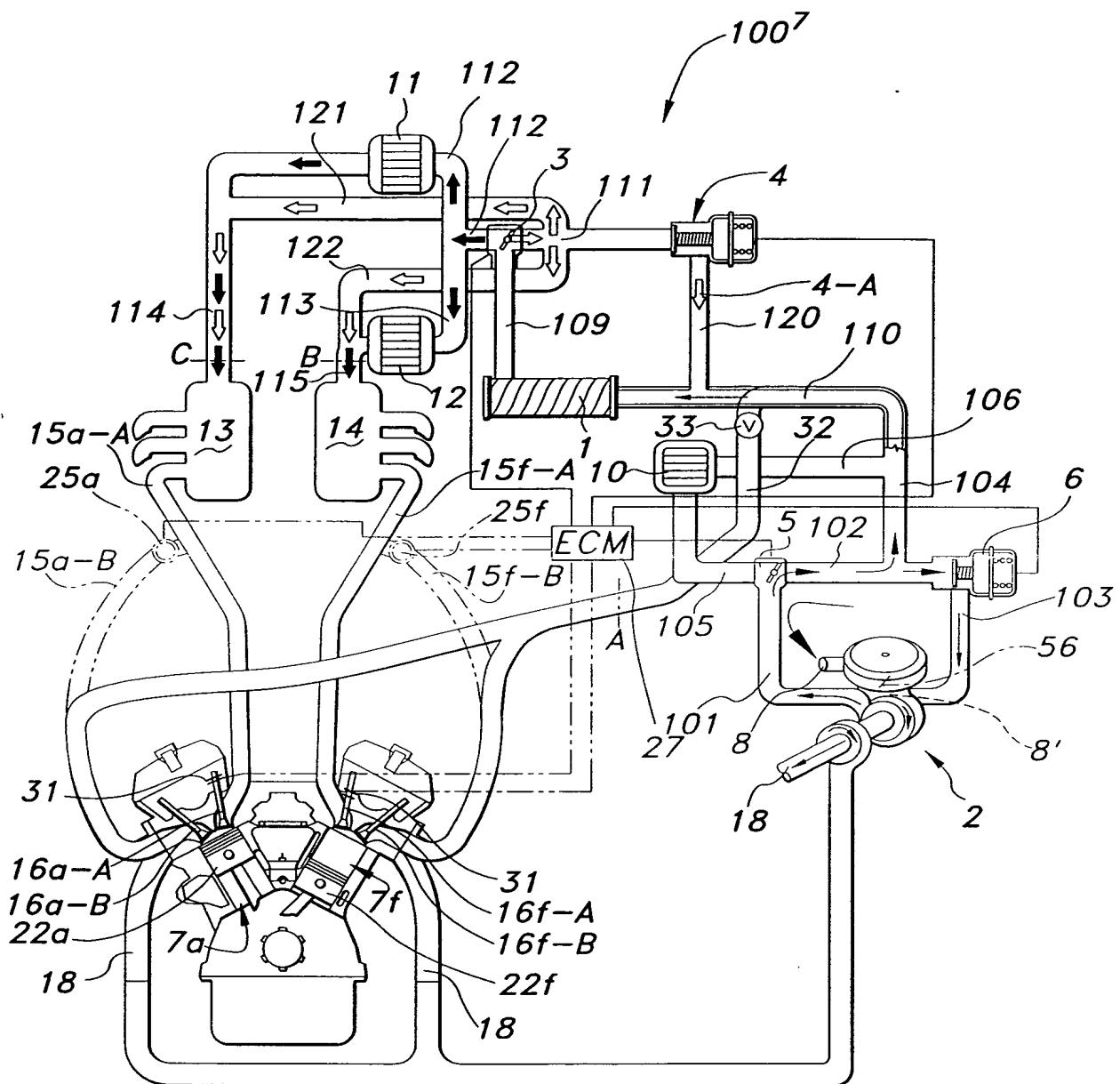


FIG 9



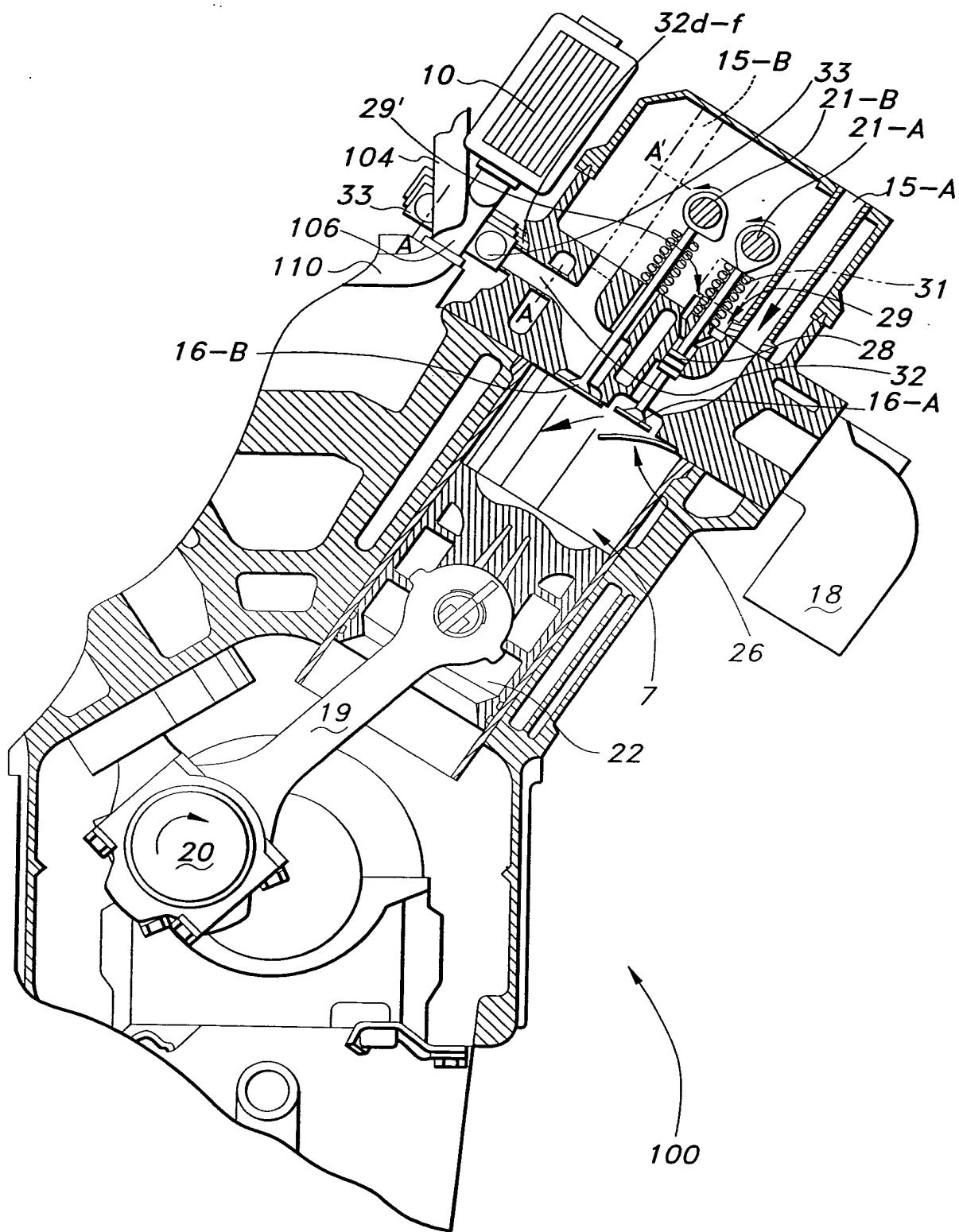
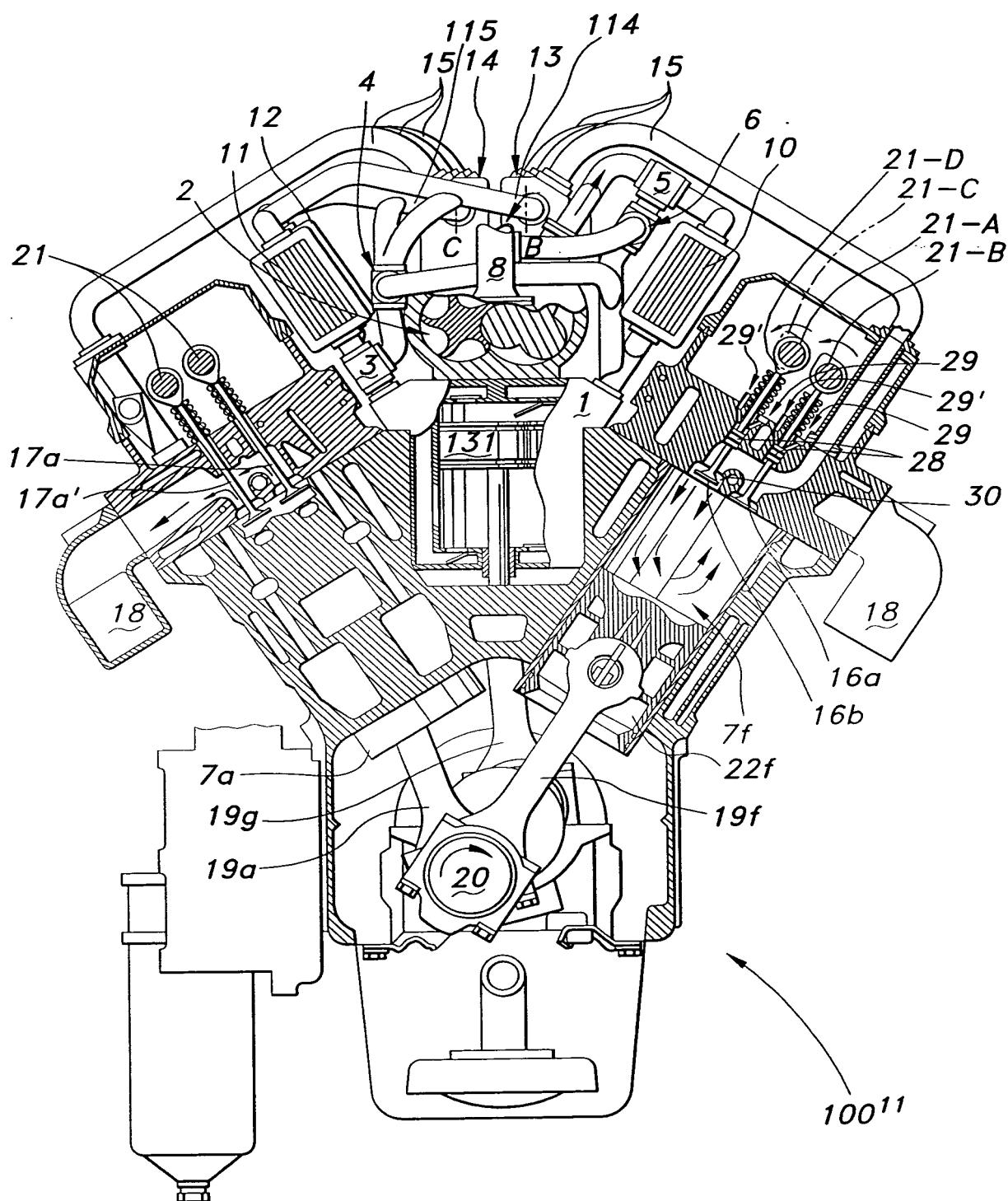
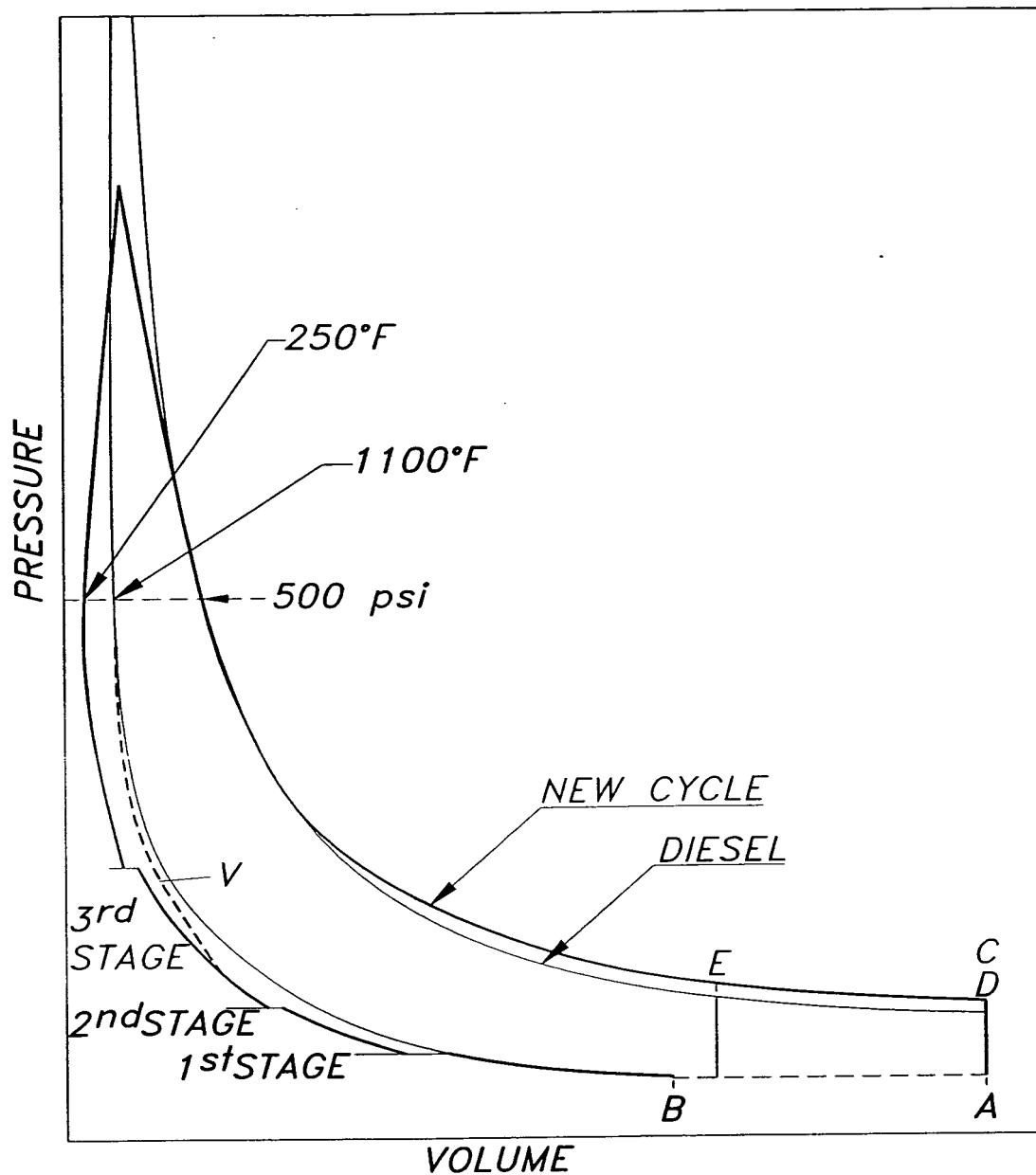


FIG 10





- A - COMPRESSION BEGINS IN 2-STROKE AND 4-STROKE DIESEL CYCLE ENGINE
- B - COMPRESSION BEGINS IN 2-STROKE AND 4-STROKE NEW CYCLE ENGINE
- C - EXPANSION ENDS IN 4-STROKE DIESEL CYCLE ENGINE
- D - EXPANSION ENDS IN 2-STROKE AND 4-STROKE NEW CYCLE ENGINE
- E - EXPANSION ENDS (AT EXHAUST BLOW-DOWN) IN 2-STROKE DIESEL CYCLE ENGINE
- V - SEE NOTE 1 IN DESCRIPTION

FIG 12

COMPARISON OF OPERATING PARAMETERS OF A HEAVY DUTY TWO-STROKE DIESEL ENGINE (A)
WITH THE ENGINE OF THIS INVENTION (B)

ENGINE	COMPRESSION RATIO OR NOMINAL COMPRESSION RATIO	EFFECTIVE COMP RATIO	COMPRESSION PRESSURE (PSI)	TEMP @ END COMP (DEG F.)	TEMP @ END COMB (DEG F.)	CHARGE DENSITY (LB./CU. FT.)	CHARGE EXPANSION RATIO	E.R. C.R.	CHARGE WEIGHT PER REVOLUTION (GRAMS)
A	19:1	19:1	907	1300	3400	1.45	*10:1	0.5	2.06
B(ic)	13:1	2:1	533	250	3000	2.03	**19:1	1.5	2.86
B(bp)	13:1	13:1	533	992	^3100	1.01	**19:1	1.5	1.43
B2(ic)	10:1	2:1	369	250	^2800	1.40	**19:1	1.9	1.98
B2(bp)	10:1	10:1	369	871	^2900	0.75	**19:1	1.9	1.06

- * Exhaust valve opens midstroke
- ** Exhaust valve opens near BDC
- (ic) Air charge intercooled except for last stage of compression
- (bp) Intercoolers bypassed
- Λ Estimated

E.R. = EXPANSION RATIO
C.R. = COMPRESSION RATIO

FIG 13

COMPARISON OF OPERATING PARAMETERS OF A HEAVY DUTY FOUR-STROKE DIESEL ENGINE (A)
WITH THE ENGINE OF THIS INVENTION (B)

ENGINE	COMPRESSION RATIO OR NOMINAL COMPRESSION RATIO	EFFECTIVE COMP RATIO	COMPRESSION PRESSURE (PSI)	TEMP @ END COMP (DEG F.)	TEMP @ END COMB (DEG F.)	CHARGE DENSITY (LB./CU. FT.)	EXPANSION RATIO	E.R. C.R.	CHARGE WEIGHT PER REVOLUTION (GRAMS)
A	19:1	19:1	907	1300	3400	1.45	19:1	1.0	*1.03
B(ic)	13:1	2:1	533	250	3000	2.03	19:1	1.5	**2.86
B(bp)	13:1	13:1	533	992	^3100	1.01	19:1	1.5	**1.43
B2(ic)	10:1	2:1	369	250	^2800	1.40	19:1	1.9	**1.98
B2(bp)	10:1	10:1	369	871	^2900	0.75	19:1	1.9	**1.06

- * Per revolution, not per firing stroke
- ** Per revolution and per firing stroke
- (ic) Air charge intercooled except for last stage of compression
- (bp) Intrecoolers bypassed
- Λ Estimated

E.R. = EXPANSION RATIO
C.R. = COMPRESSION RATIO

FIG 14

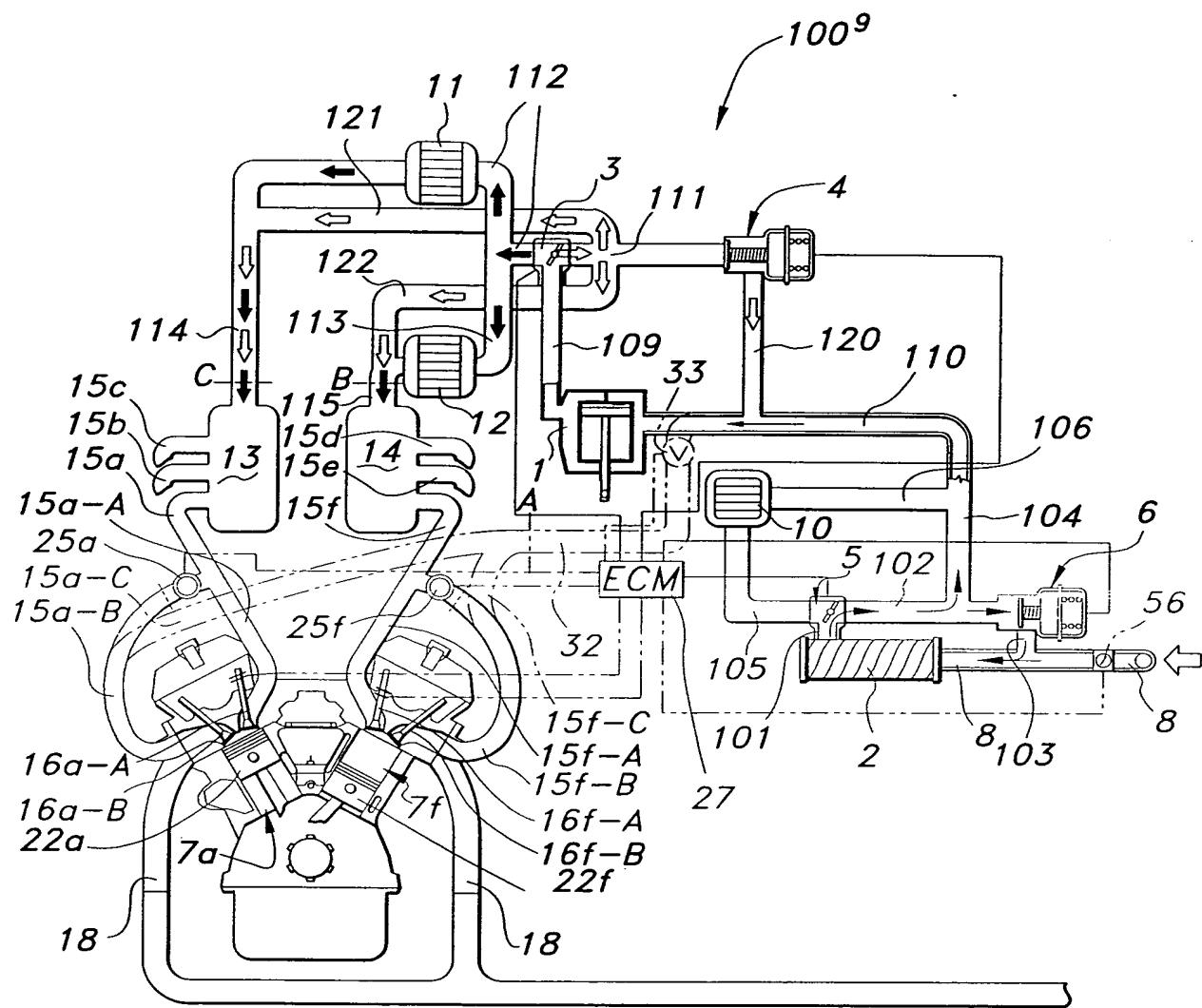


FIG 15

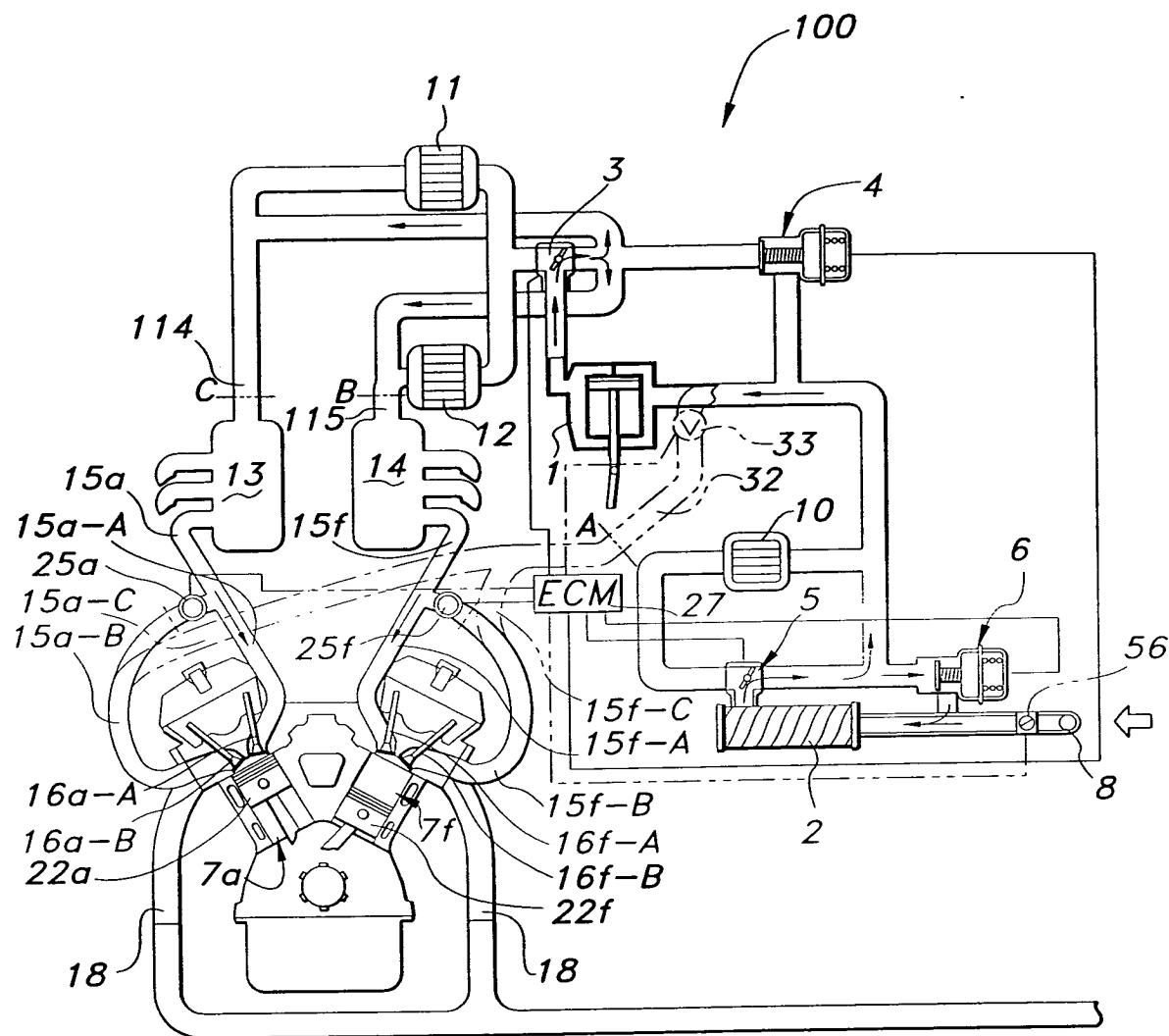


FIG 16

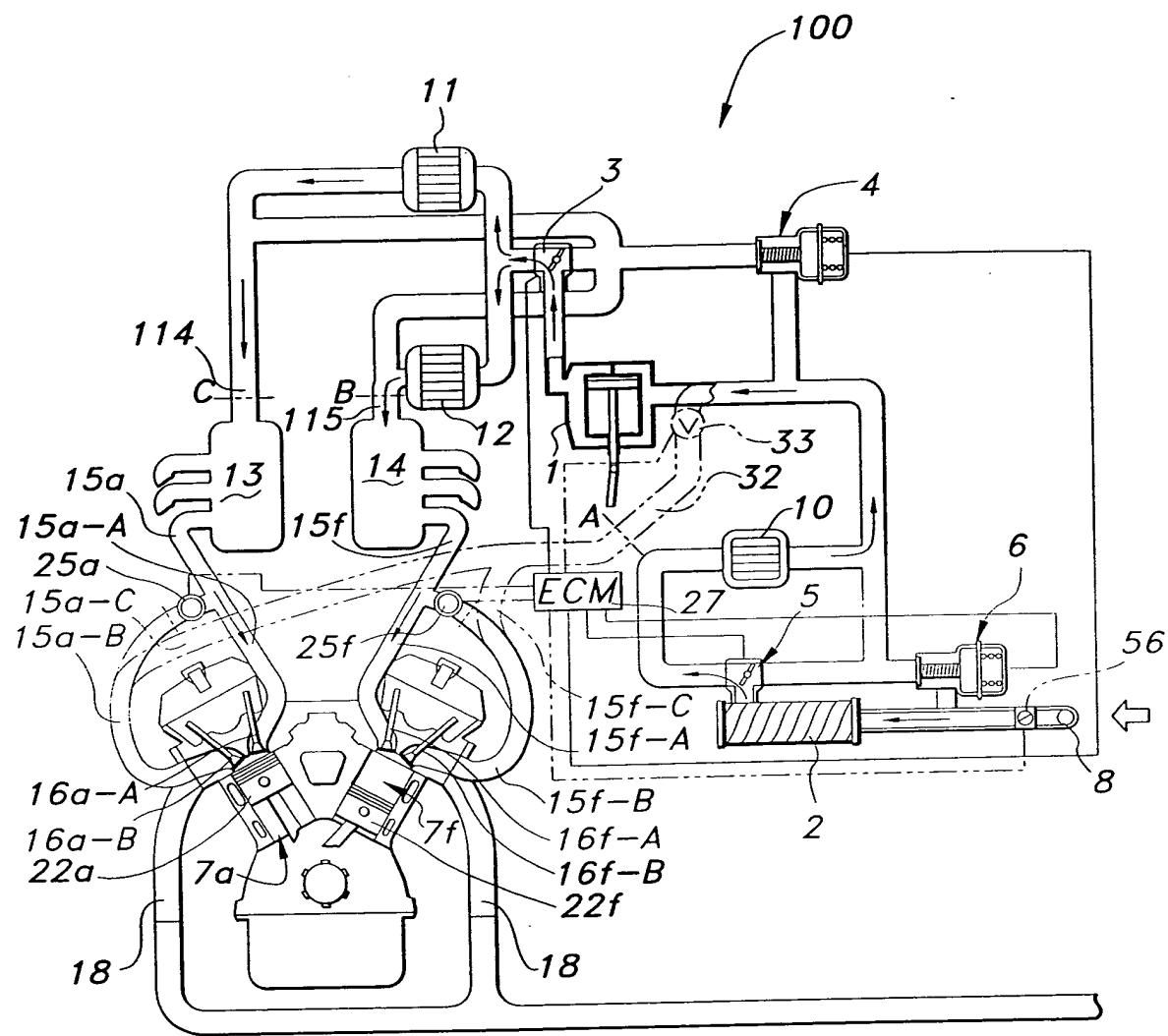


FIG 17

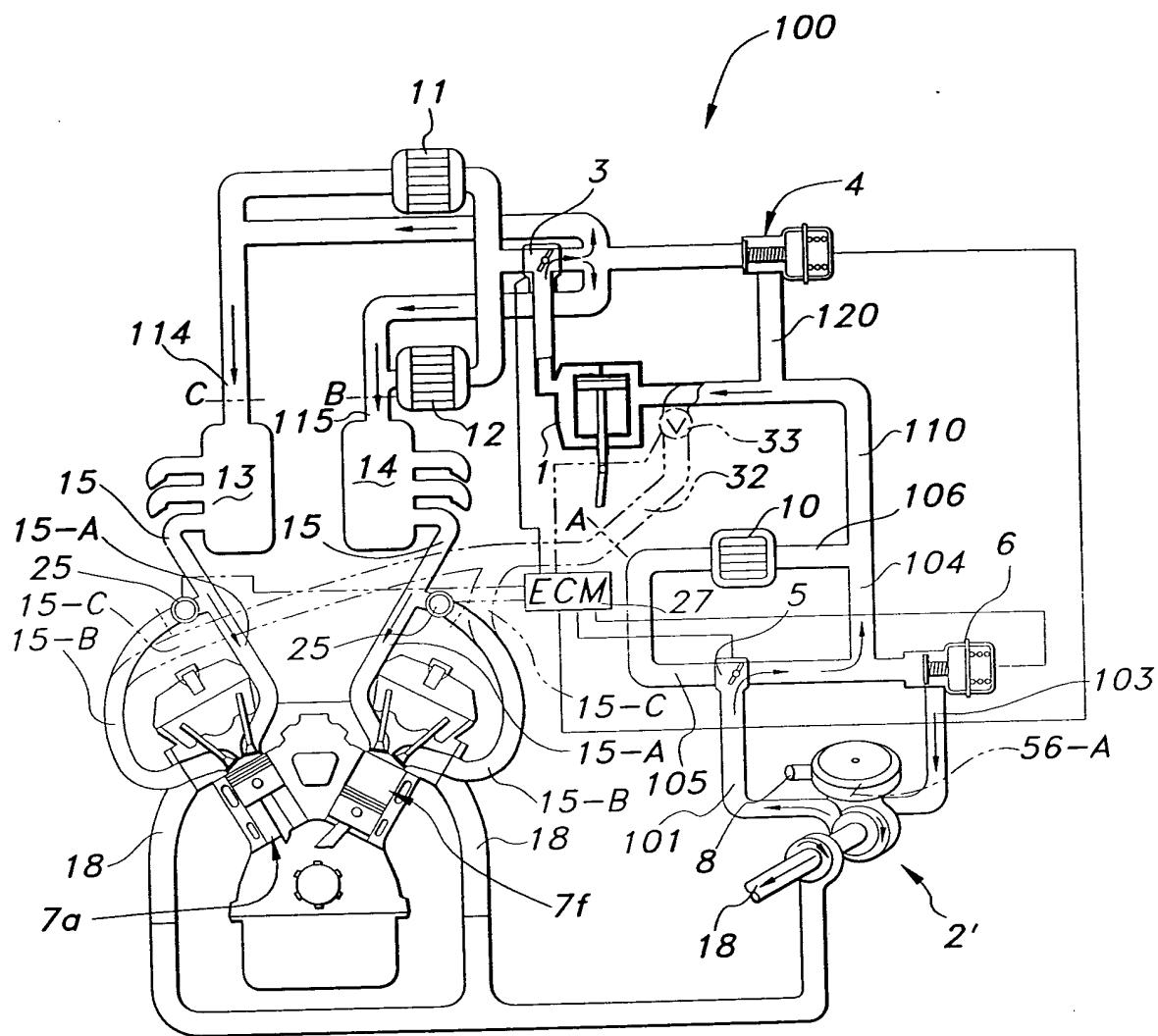
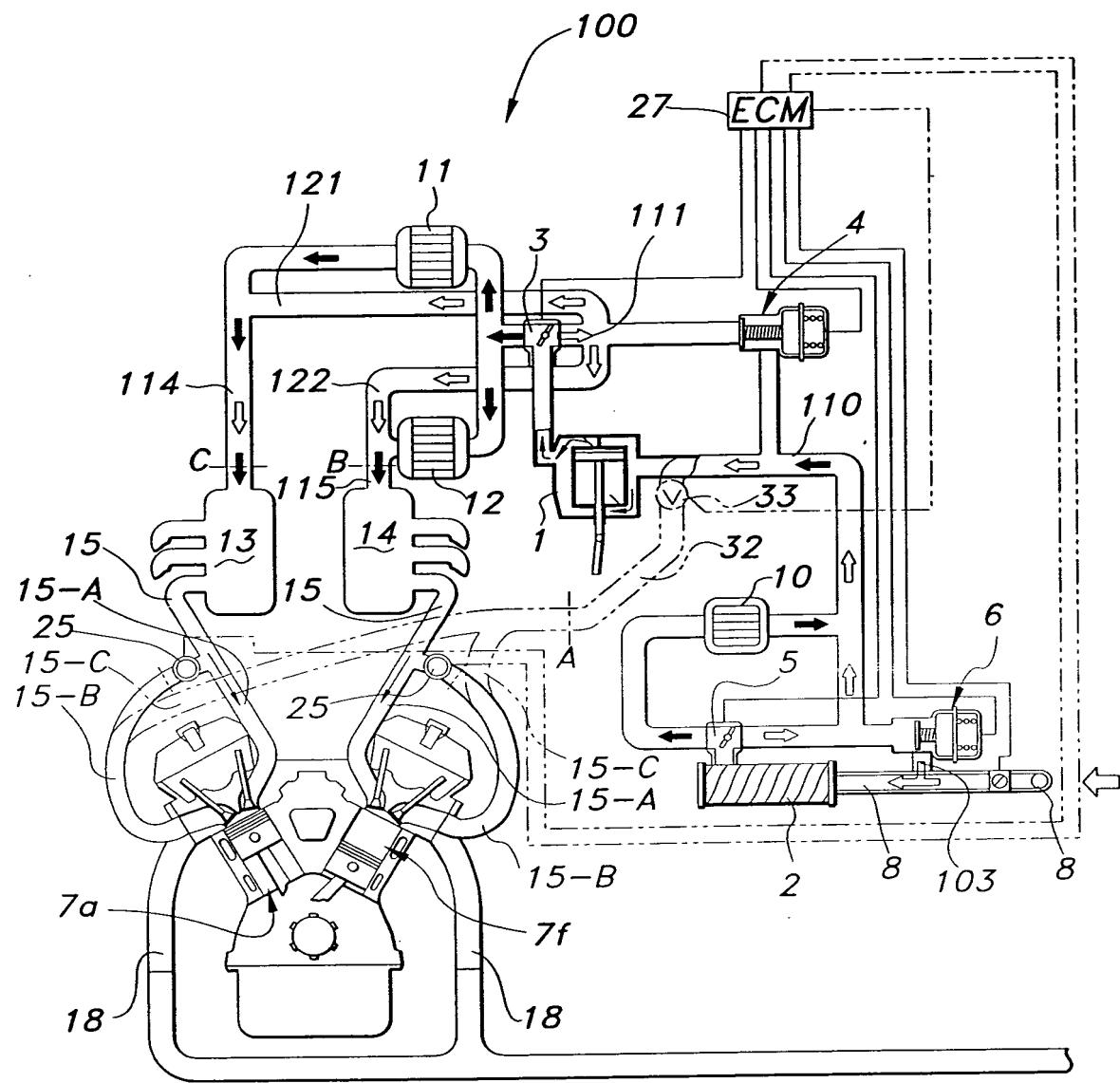


FIG 18



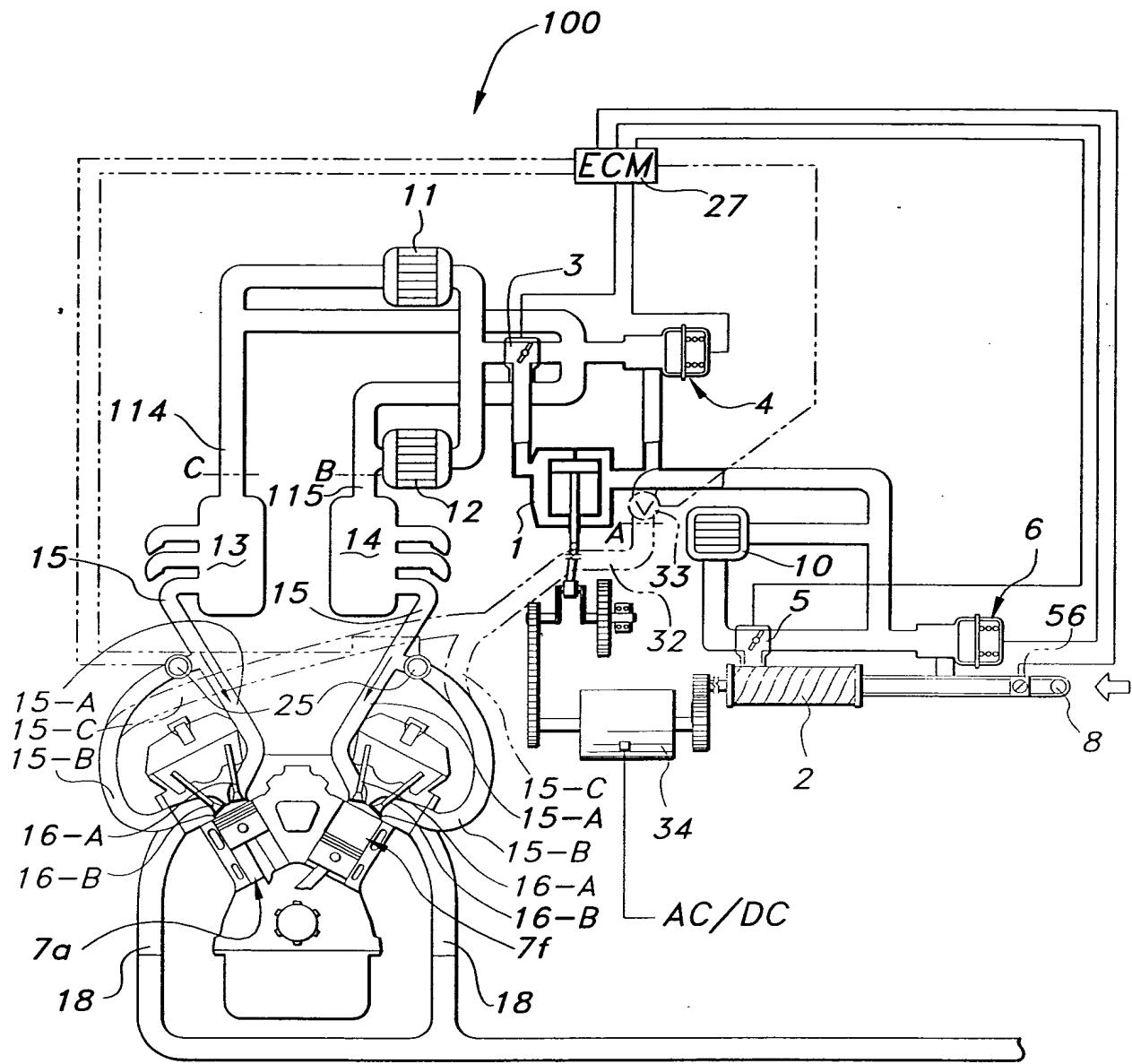


FIG 20

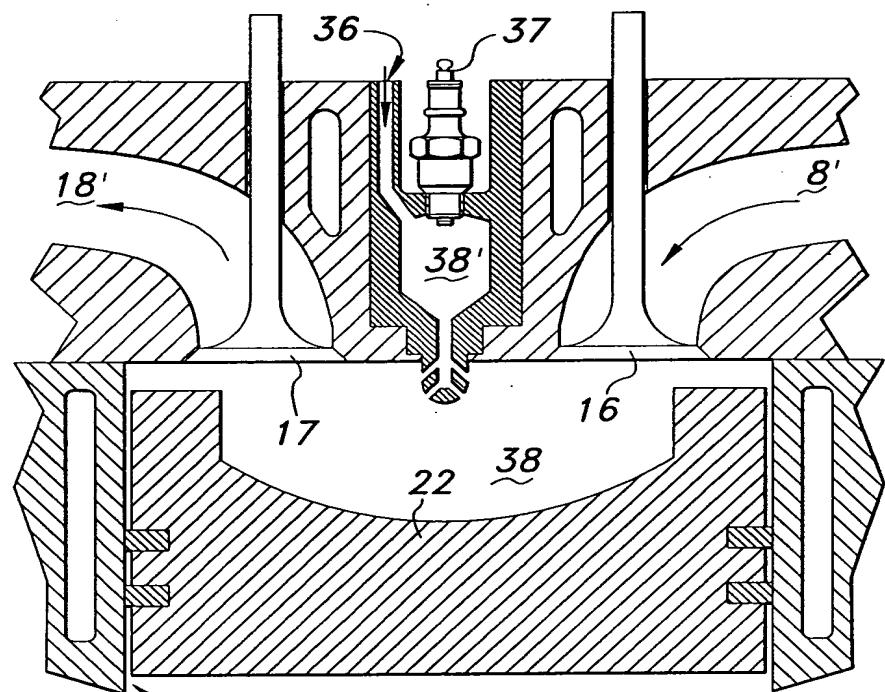


FIG 21

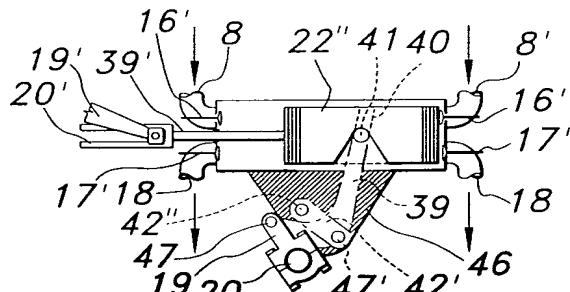


FIG 23

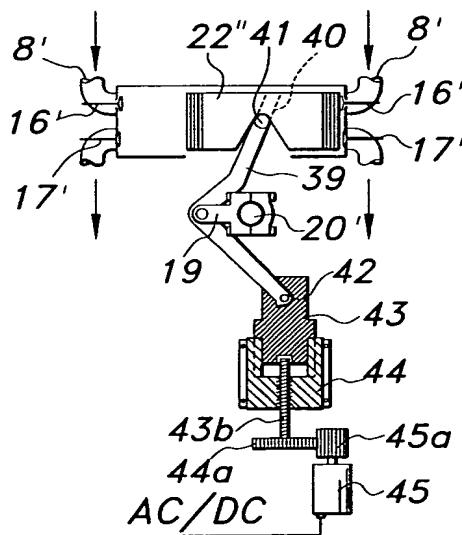


FIG 22

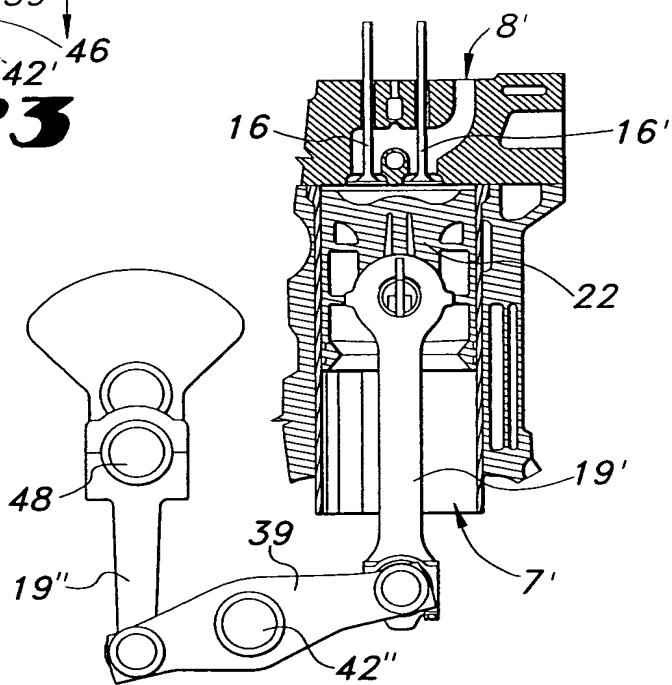


FIG 24

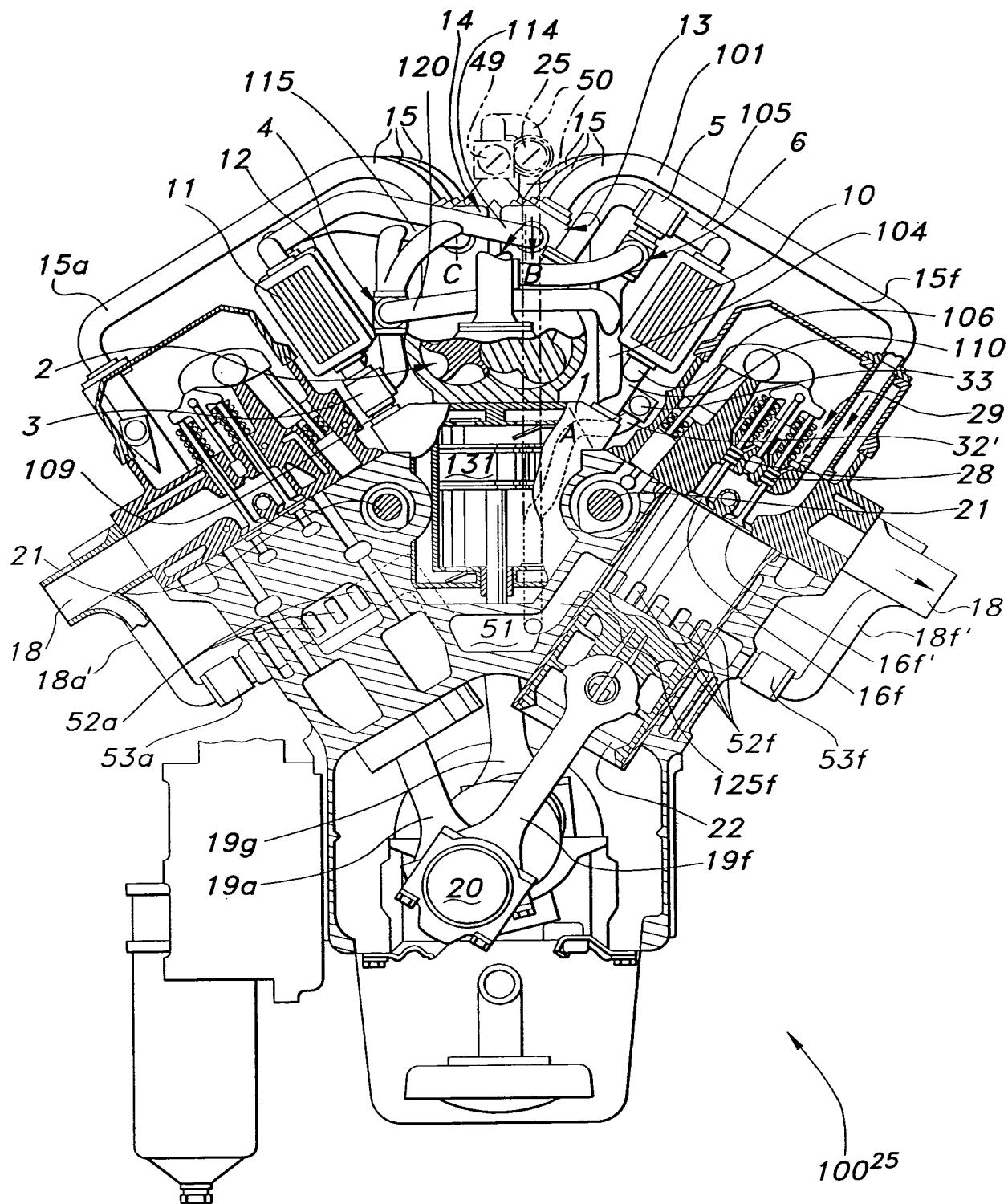
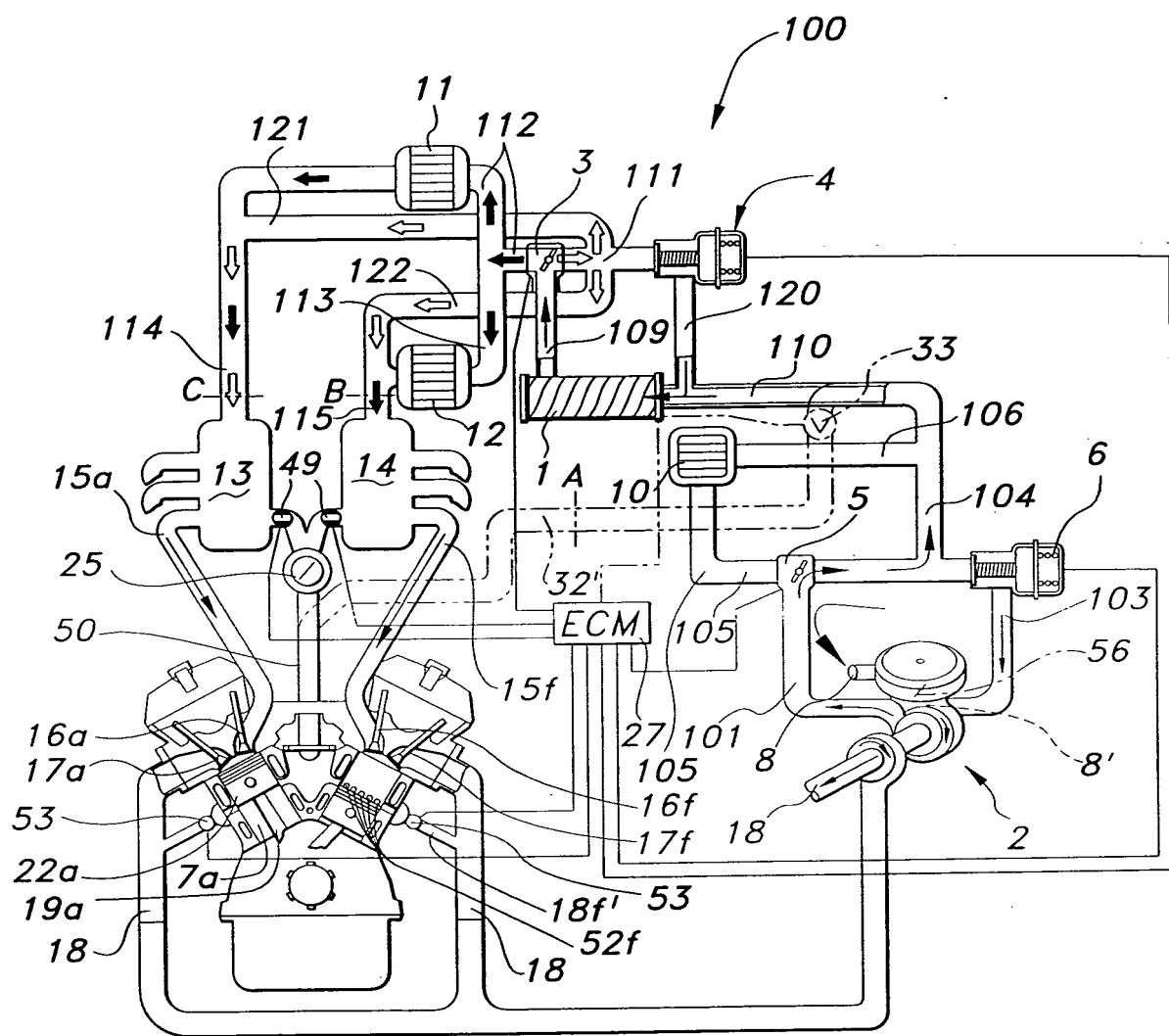


FIG 25



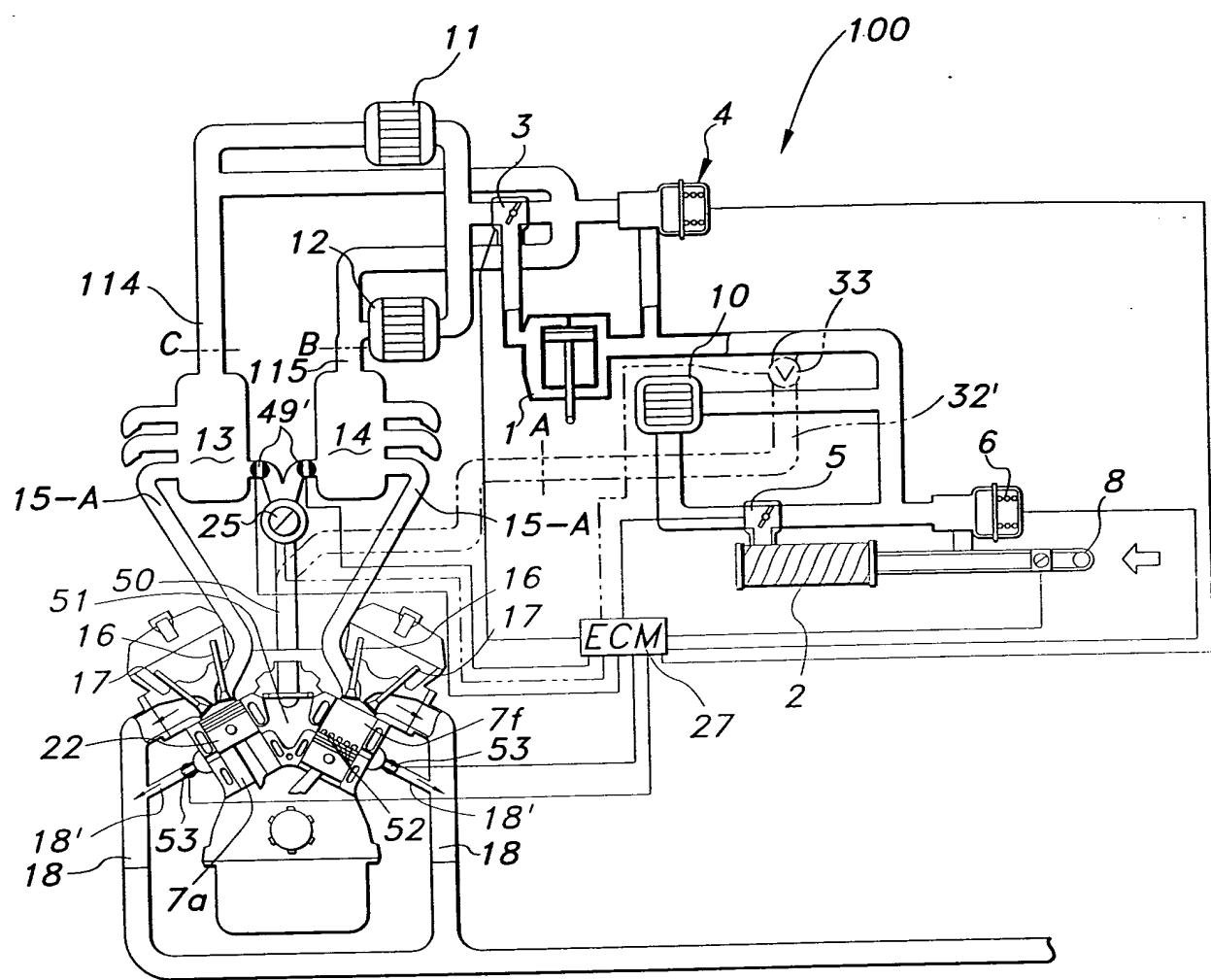


FIG 27

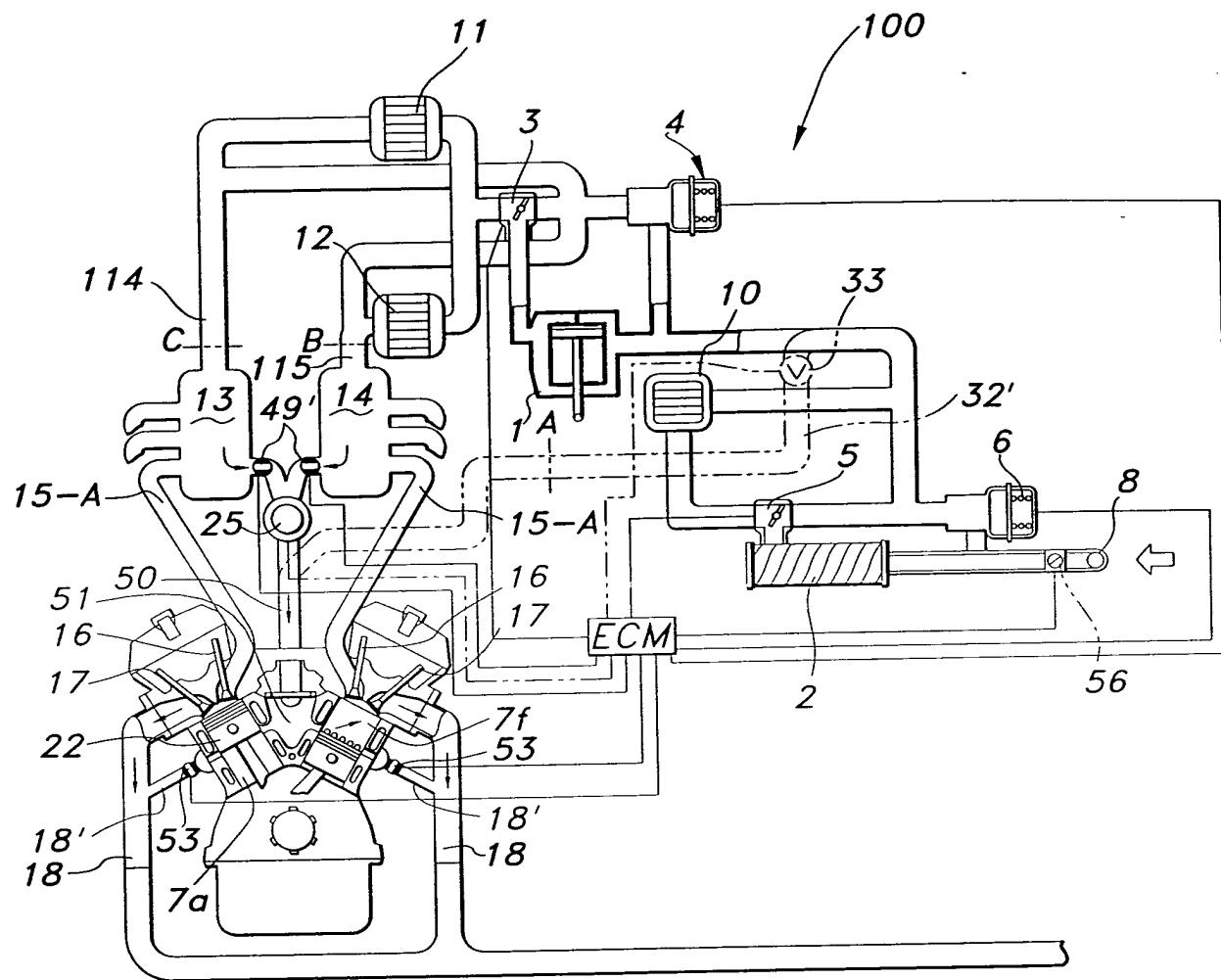


FIG 28

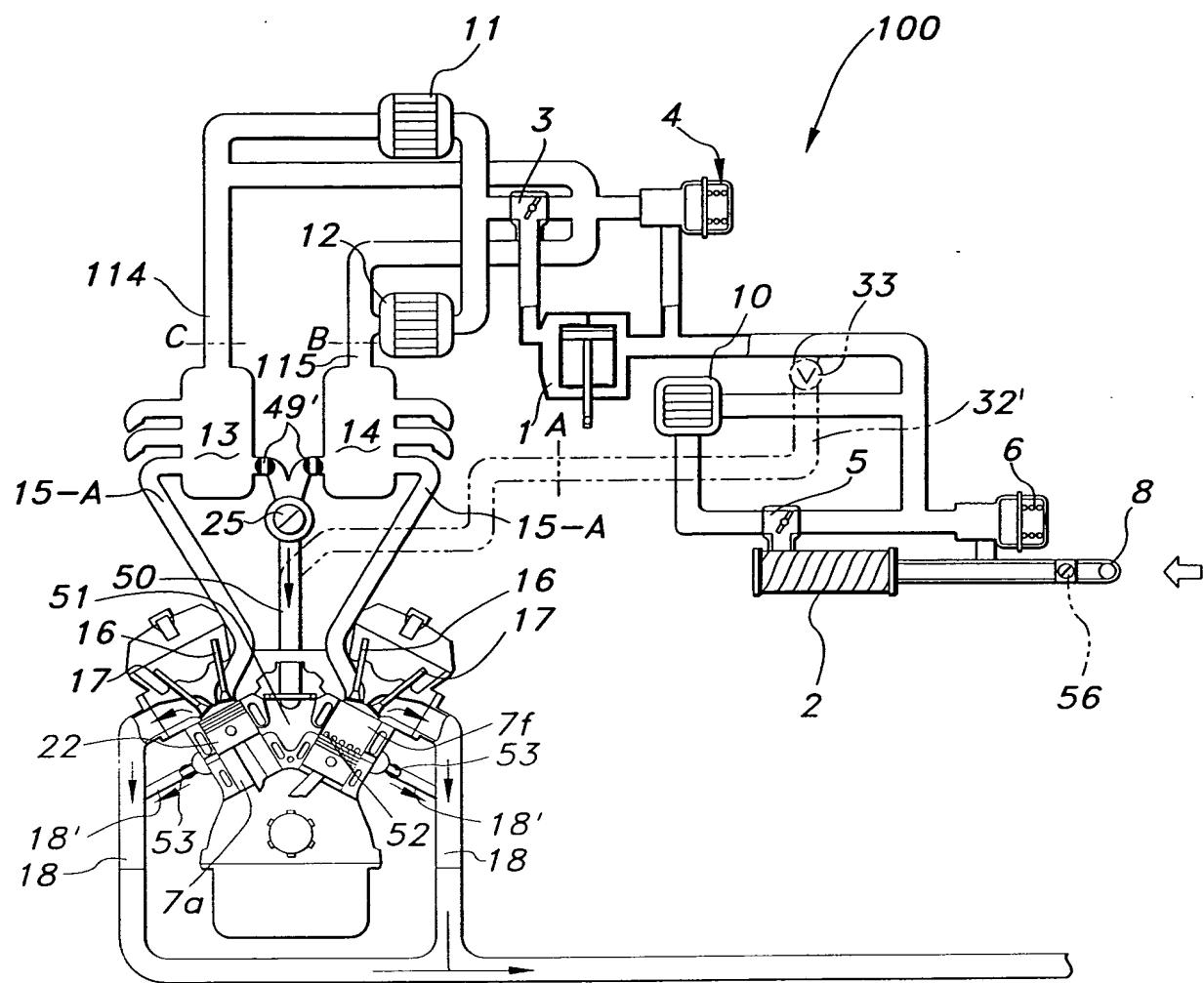


FIG 29

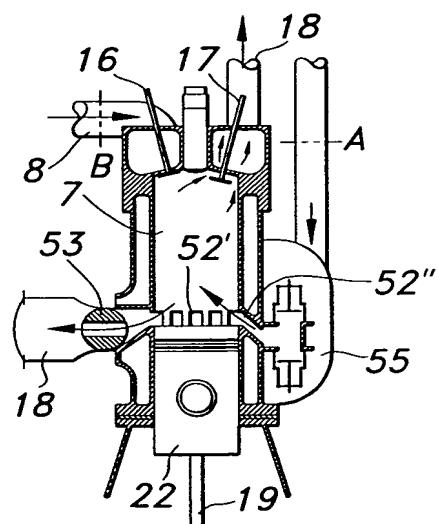


FIG 30

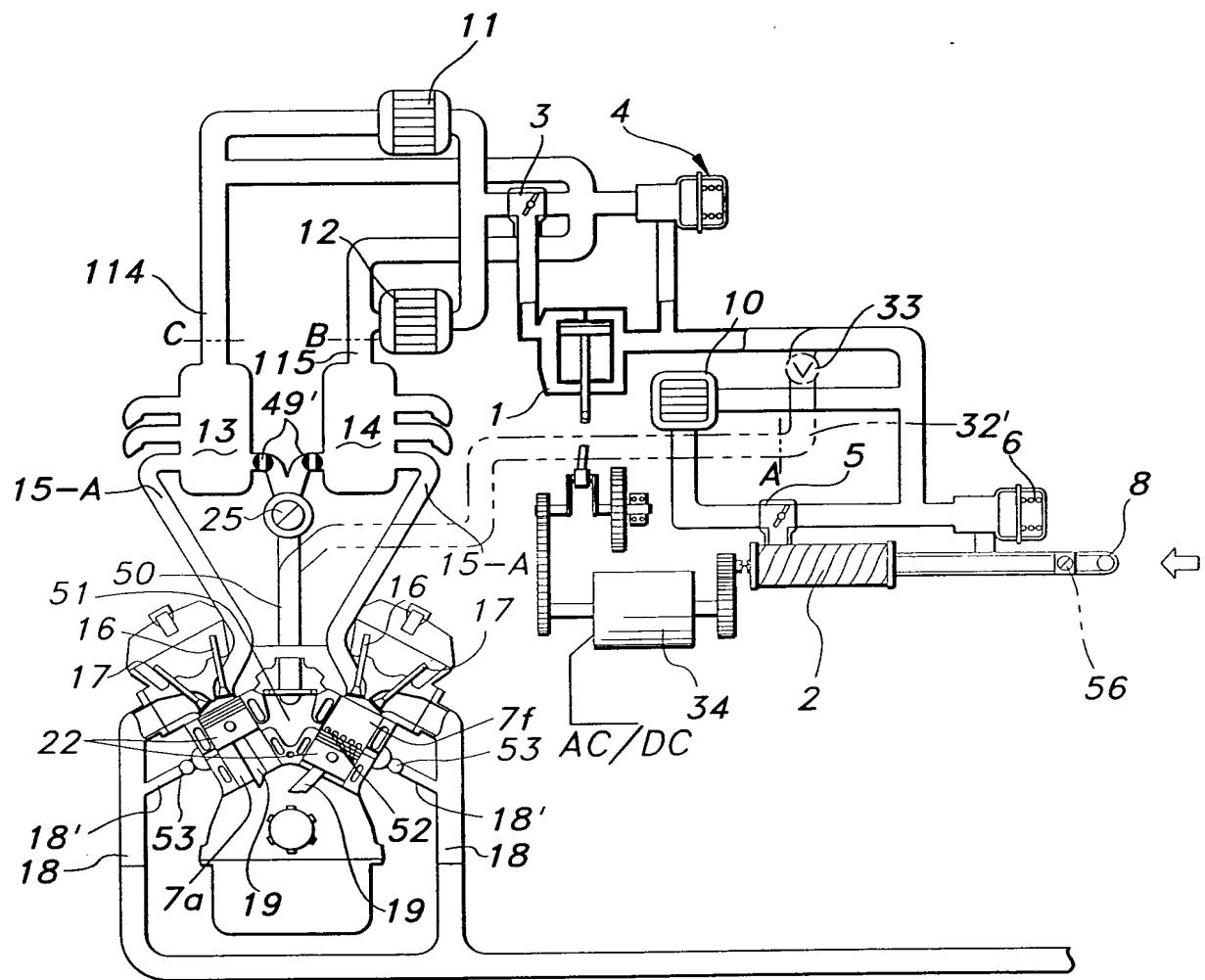


FIG 31

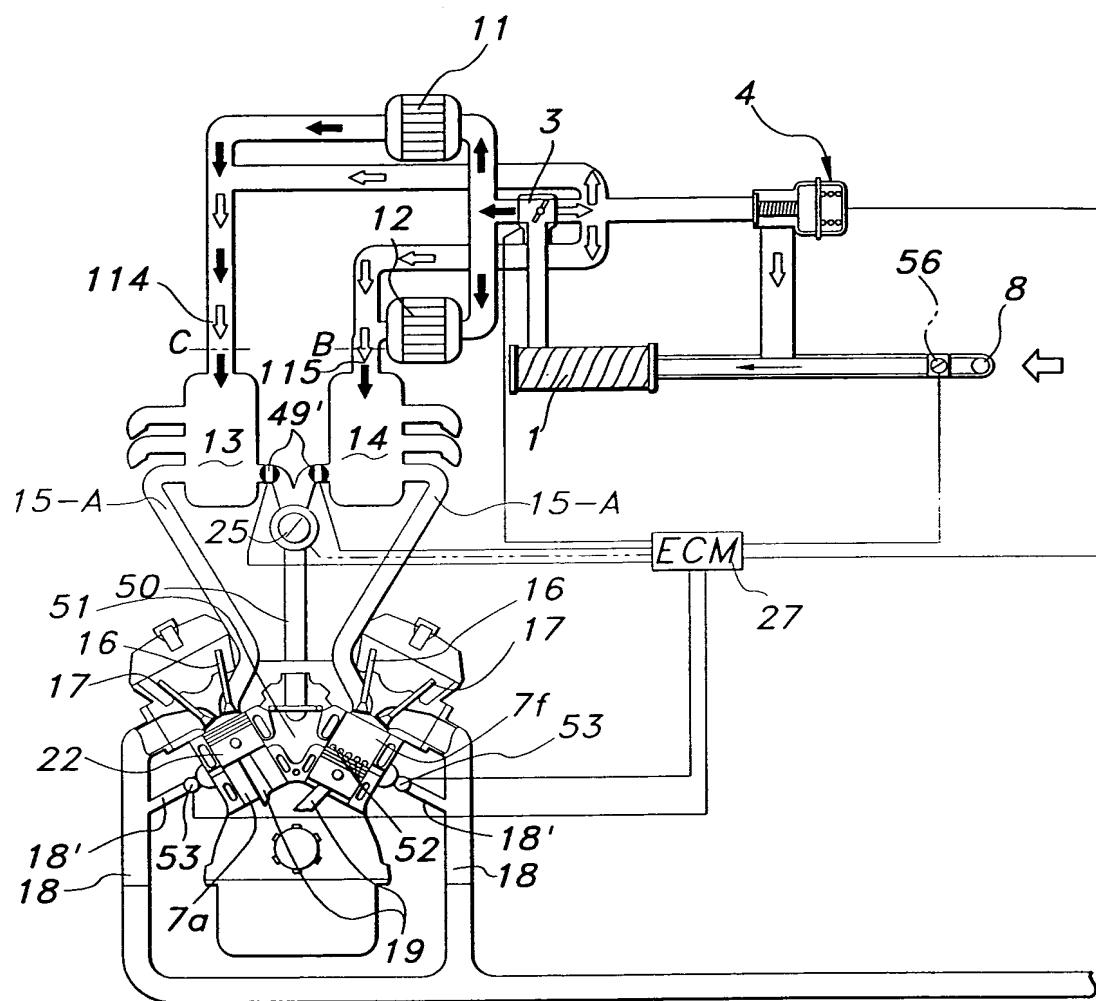


FIG 32

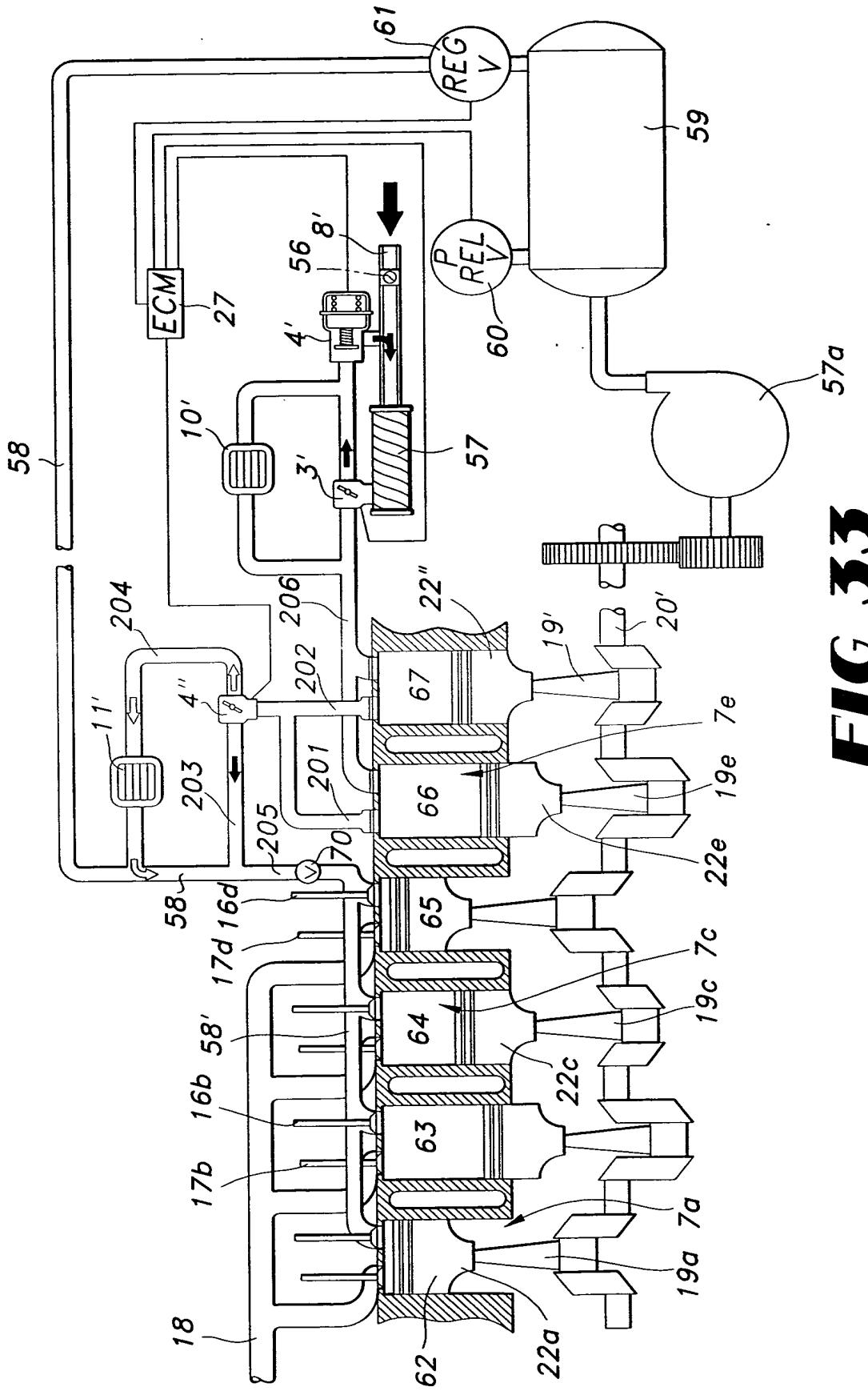


FIG 33

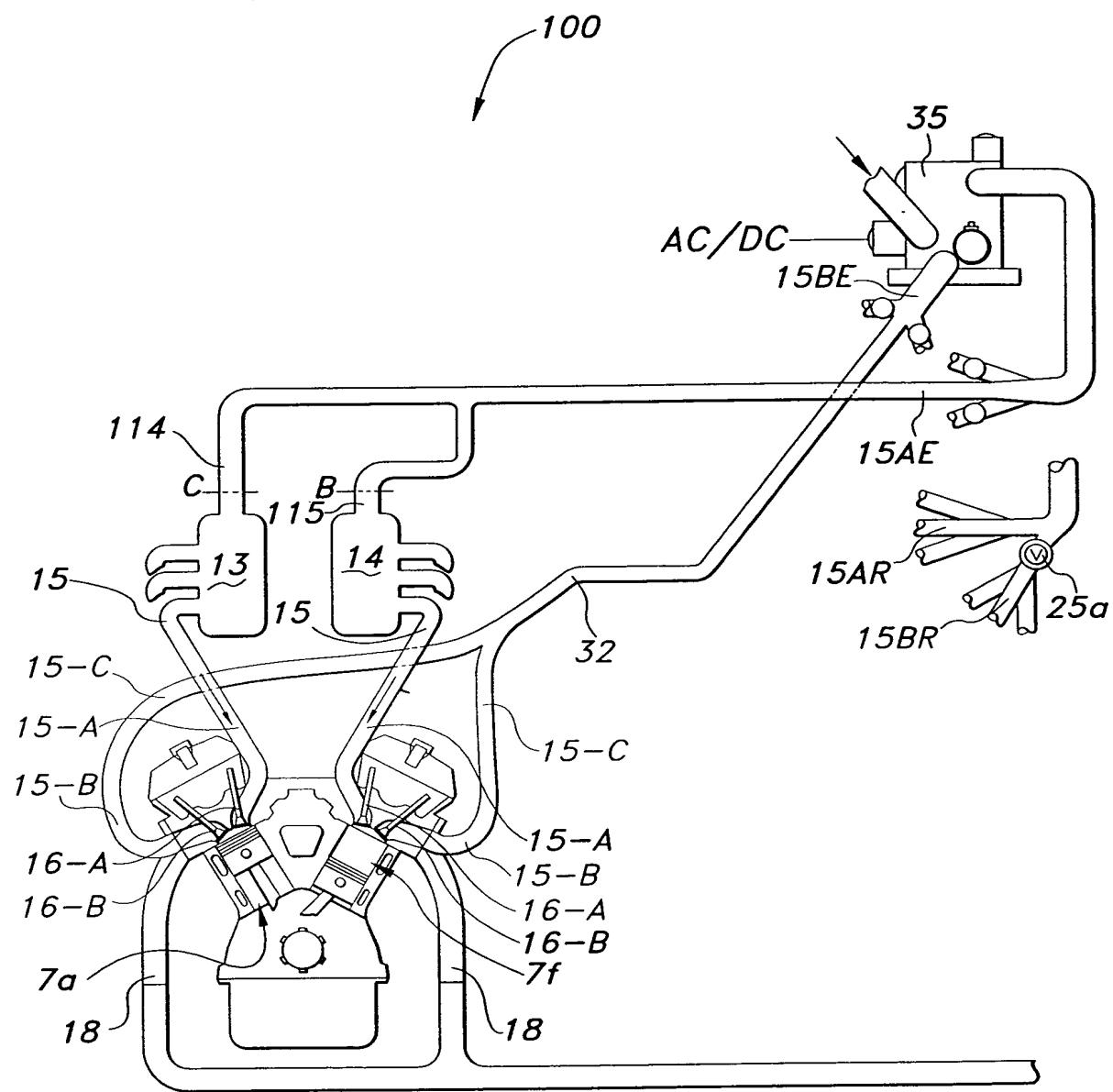


FIG 34

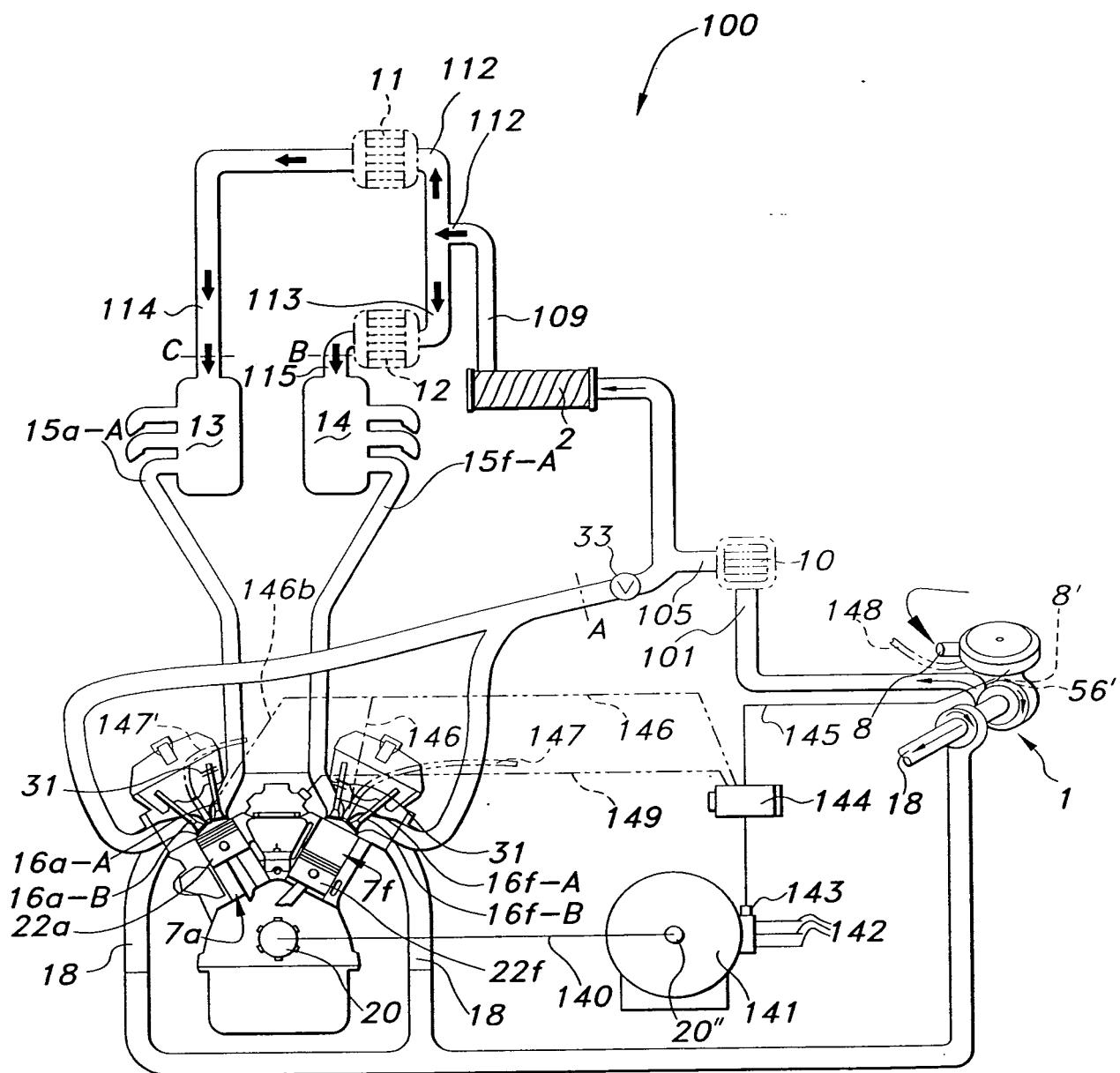


FIG 35

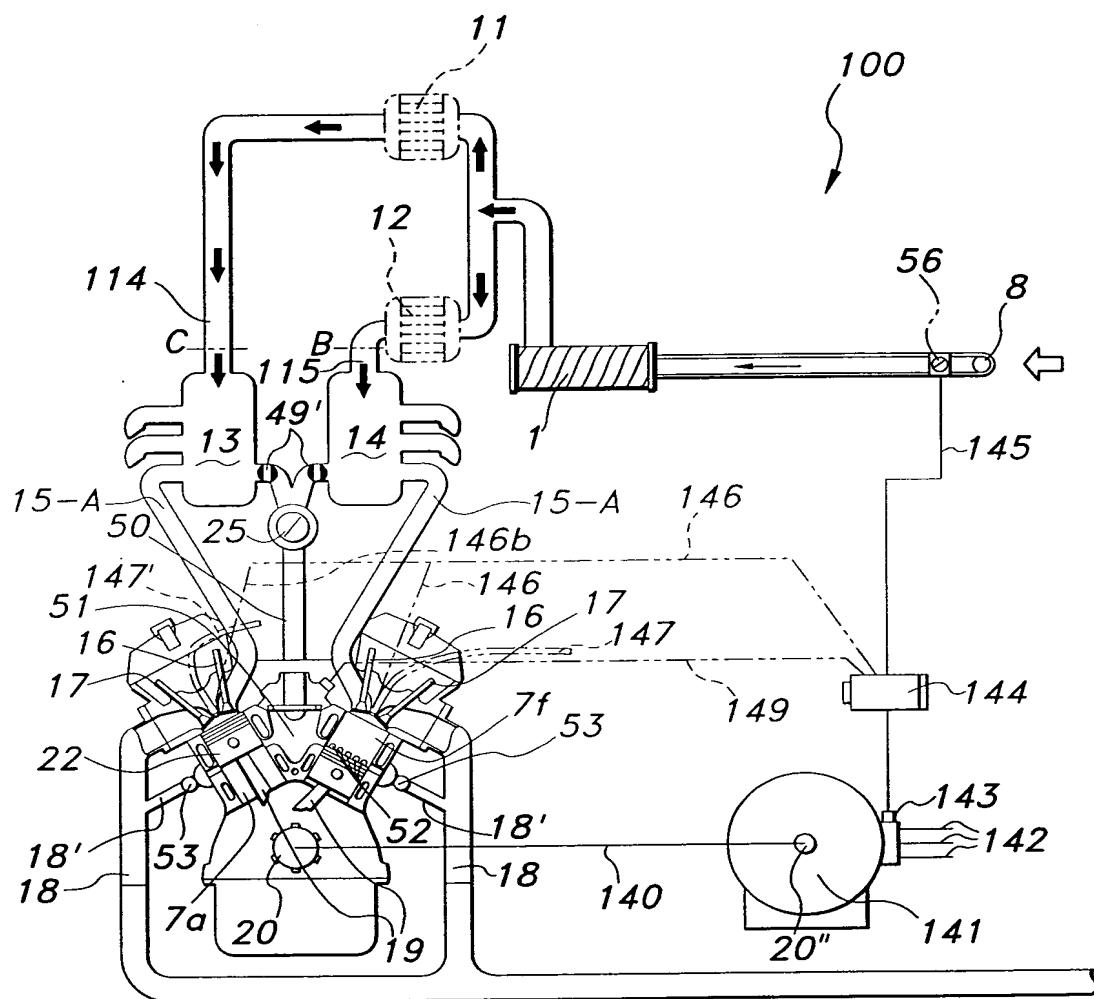


FIG 36